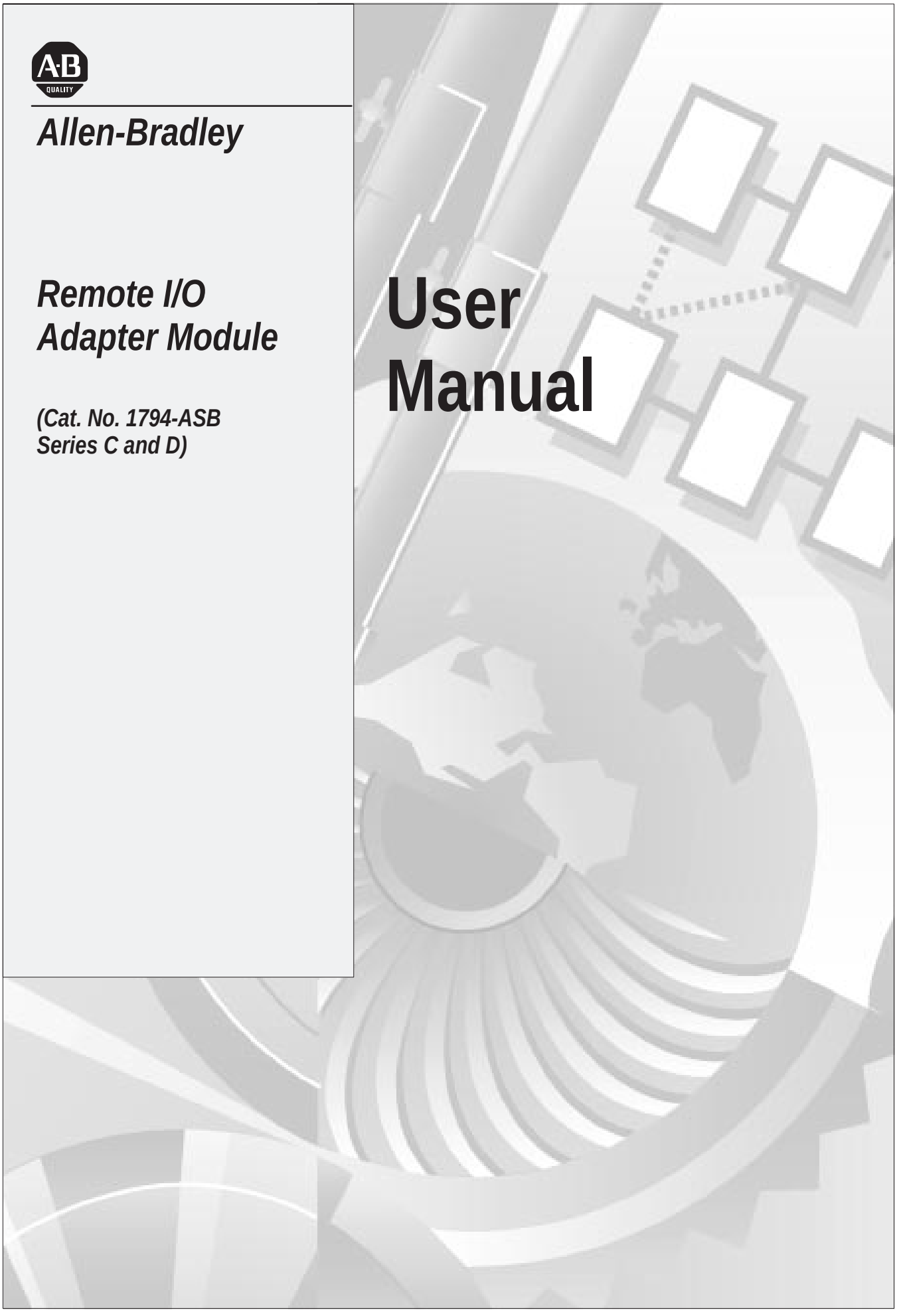


Allen-Bradley

Remote I/O Adapter Module

(Cat. No. 1794-ASB Series C and D)

User Manual

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI–1.1, “Safety Guidelines For The Application, Installation and Maintenance of Solid State Control” (available from your local Allen-Bradley office) describes some important differences between solid-state equipment and electromechanical devices which should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we make notes to alert you to possible injury to people or damage to equipment under specific circumstances.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention helps you:

- Identify a hazard.
- Avoid the hazard.
- Recognize the consequences.

Important: Identifies information that is especially important for successful application and understanding of the product.

Important: We recommend you frequently backup your application programs on appropriate storage medium to avoid possible data loss.

Summary of Changes

The information below summarizes the changes to the Remote I/O Adapter User Manual, publication 1794-6.5.9, since the last release.

New Information

The following new information is included in this version of the publication:

Series Change for the Adapter

This publication now covers both the series C and series D adapters. The series D adapter is capable of recognizing the safe state data for the FLEX Integra analog modules. You must use a series D adapter when using FLEX Integra analog modules in your system.

Additional FLEX I/O Modules

New modules available since the last version of this publication have been added.

Change Bars

The areas in this manual which are different from previous editions are marked with change bars (as shown to the right of this paragraph) to indicate the addition of new or revised information.

Using This Manual

Preface Objectives

Read this preface to familiarize yourself with this manual and to learn how to use it properly and efficiently.

Audience

We assume that you have previously used an Allen–Bradley programmable controller, that you are familiar with its features, and that you are familiar with the terminology we use. If not, read the user manual for your processor before reading this manual.

Vocabulary

In this manual, we refer to:

- the individual adapter module as the “adapter.”
- the programmable controller as the “controller” or the “processor.”
- input and output modules as the “module.”

What This Manual Contains

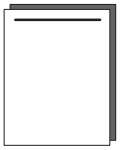
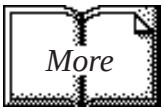
The contents of this manual are as follows:

Table P. A
What This Manual Contains

Chapter	Title	What's Covered
1	Overview of FLEX I/O and the Remote I/O Adapter Module	Describes features, capabilities, and hardware components.
2	Installing Your Remote I/O Adapter	Procedures and guidelines for installing the module
3	Communicating with FLEX I/O Modules	Hardware addressing and configuration options
4	Troubleshooting	Troubleshooting aids
Appendix	**Title**	**What's Covered**
A	Specifications	Module specifications
B	Differences Between Series A, B and C Remote I/O Adapters	

Conventions

We use these conventions in this manual:

In this manual, we show:	Like this:
that there is more information about a topic in another chapter in this manual	
that there is more information about the topic in another manual	

For Additional Information

For additional information on FLEX I/O systems and modules, refer to the following documents:

Catalog Number	Voltage	Description	Publications	
			Installation Instructions	User Manual
1794		1794 FLEX I/O Product Data	1794-2.1	
1794-ACN	24V dc	ControlNet Adapter	1794-5.8	
1794-ACNR	24V dc	Redundant Media ControlNet Adapter	1794-5.18	
1794-ACN15	24V dc	ControlNet Adapter	1794-5.47	
1794-ACNR15	24V dc	Redundant Media ControlNet Adapter	1794-5.48	
1794-ADN	24V dc	DeviceNet Adapter	1794-5.14	1794-6.5.5
1794-ASB/C & D	24V dc	Remote I/O Adapter	1794-5.46	1794-6.5.9
1794-ASB2/B	24V dc	2-Slot Remote I/O Adapter	1794-5.44	1794-6.5.13
1794-APB	24V dc	Profibus Adapter	1794-5.40	1794-6.5.6
1794-IB8	24V dc	8 Sink Input Module	1794-5.30	
1794-OB8	24V dc	8 Source Output Module	1794-5.31	
1794-IB16	24V dc	16 Sink Input Module	1794-5.4	
1794-OB16	24V dc	16 Source Output Module	1794-5.3	
1794-IV16	24V dc	16 Source Input Module	1794-5.28	
1794-OV16	24V dc	16 Sink Output Module	1794-5.29	
1794-OB8EP	24V dc	8 Electronically Fused Output Module	1794-5.20	
1794-IB8S	24V dc	Sensor Input Module	1794-5.7	
1794-IB10XOB6	24V dc	10 Input/6 Output Module	1794-5.24	
1794-IE8	24V dc	Selectable Analog 8 Input Module	1794-5.6	
1794-OE4	24V dc	Selectable Analog 4 Output Module	1794-5.5	1794-6.5.2
1794-IE4XOE2	24V dc	4 Input/2 Output Analog Module	1794-5.15	

Table continued on next page

Catalog Number	Voltage	Description	Publications	
			Installation Instructions	User Manual
1794-OF4	24V dc	4 Output Isolated Analog Module	1794-5.37	1794-6.5.8
1794-IF4	24V dc	4 Input Isolated Analog Module	1794-5.38	
1794-IF2XOF2	24V dc	2 Input/2 Output Isolated Analog Module	1794-5.39	
1794-IR8	24V dc	8 RTD Input Analog Module	1794-5.22	1794-6.5.4
1794-IT8	24V dc	8 Thermocouple Input Module	1794-5.21	1794-6.5.7
1794-IRT8	24V dc	8 Thermocouple/RTD Input Module	1794-5.50	1794-6.5.12
1794-IJ2	24V dc	2 Frequency Input Module	1794-5.49	1794-6.5.11
1794-ID2	24V dc	2 Channel Frequency Input Module	1794-5.63	1794-6.5.15
1794-IP4	24V dc	2 Channel Pulse Counter Module	1794-5.64	1794-6.5.16
1794-HSC	24V dc	High Speed Counter Module	1794-5.67	1794-6.5.10
1794-IC16	48V dc	48V dc 16 Input Module	1794-5.53	
1794-OC16	48V dc	48V dc Output Module	1794-5.54	
1794-IA8	120V ac	8 Input Module	1794-5.9	
1794-OA8	120V ac	8 Output Module	1794-5.10	
1794-IA8I	120V ac	Isolated 8 Input Module	1794-5.55	
1794-OA8I	120V ac	Isolated Output Module	1794-5.56	
1794-IA16	120V ac	16 Input Module	1794-5.60	
1794-OA16	120V ac	16 Output Module	1794-5.61	
1794-IM8	220V ac/dc	8 Input Module	1794-5.57	
1794-OM8	220V ac/dc	8 Output Module	1794-5.58	
1794-TB2 1794-TB3		2-wire Terminal Base 3-wire Terminal Base	1794-5.2	
1794-TBN		Terminal Base Unit	1794-5.16	
1794-TBNF		Fused Terminal Base Unit	1794-5.17	
1794-TB3T		Temperature Terminal Base Unit	1794-5.41	
1794-TB3S		Spring Clamp Terminal Base Unit	1794-5.42	
1794-TB3TS		Spring Clamp Temperature Base Unit	1794-5.43	
1794-TB3G		Terminal Base Unit	1794-5.51	
1794-TB3GS		Spring Clamp Terminal Base Unit	1794-5.59	
1794-CE1, -CE3		Extender Cables	1794-5.12	
1794-NM1		Mounting Kit	1794-5.13	
1794-PS1	24V dc	Power Supply	1794-5.35	

Summary

This preface gave you information on how to use this manual efficiently. The next chapter introduces you to the remote I/O adapter module.

Table of Contents

Overview of FLEX I/O and your Remote I/O Adapter Module

Chapter 1

Installing Your Remote I/O Adapter Module

Chapter 2

Communicating with FLEX I/O Modules

Chapter 3

Overview of FLEX I/O and your Remote I/O Adapter Module

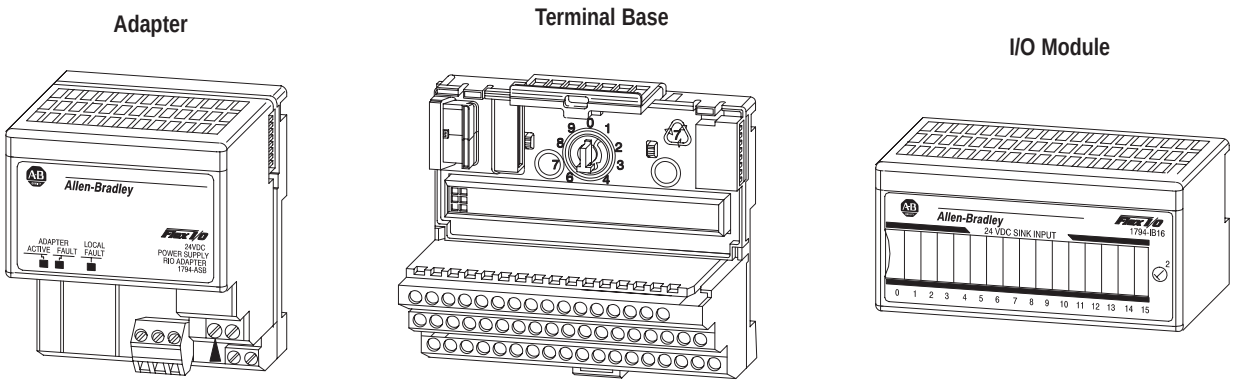
Chapter Objectives

In this chapter, we tell you about:

- what the FLEX I/O system is and what it contains
- how FLEX I/O modules communicate with programmable controllers
- the features of your adapter module

The FLEX I/O System

FLEX I/O is a small, modular I/O system for distributed applications that performs all of the functions of rack-based I/O. The FLEX I/O system contains the following components shown below:



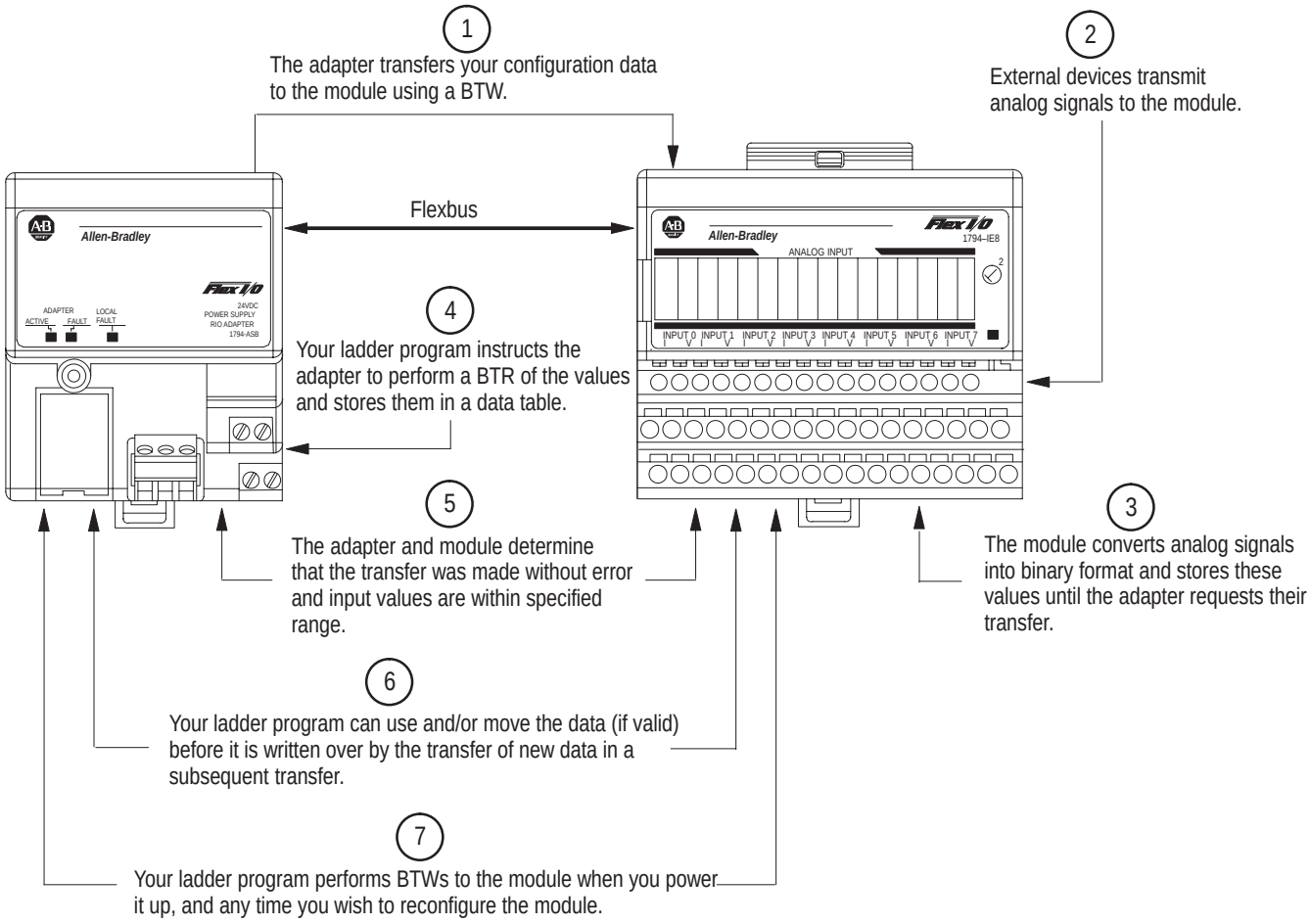
20125

- adapter/power supply – powers the internal logic for as many as eight I/O modules
- terminal base – contains a terminal strip to terminate wiring for two- or three-wire devices
- I/O module – contains the bus interface and circuitry needed to perform specific functions related to your application

How FLEX I/O Modules Communicate with Programmable Controllers

Data transfer to and from the remote I/O adapter/power supply and discrete I/O modules occurs every flexbus scan. This provides the controller with updated data.

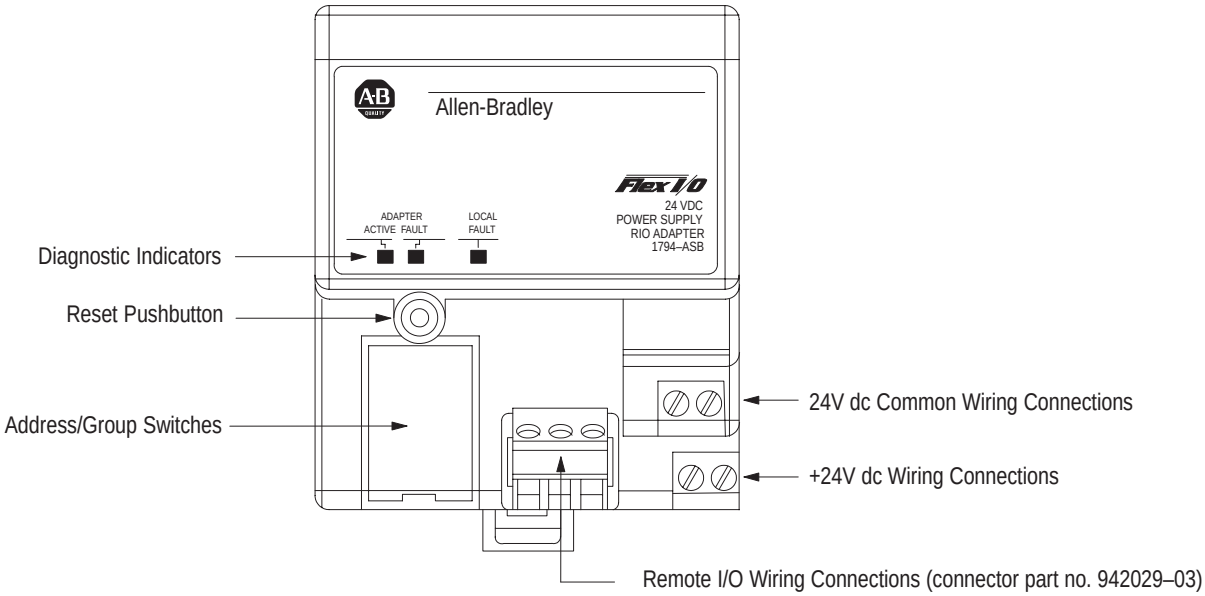
The remote I/O adapter/power supply transfers data to the analog I/O module (block transfer write) and from the analog I/O module (block transfer read) using BTW and BTR instructions in your ladder diagram program. These instructions let the adapter obtain input values and status from the I/O module, and let you send output values to establish the module's mode of operation. The communication process is described in the following illustration.



Hardware Components

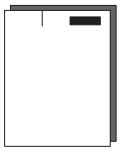
The adapter module consists of the following major components:

- diagnostic indicators
- reset pushbutton
- remote I/O wiring connections
- 24V dc power wiring connections
- address/group switch assemblies



Diagnostic Indicators

Diagnostic indicators are located on the front panel of the adapter module. They show both normal operation and error conditions in your remote I/O system. The indicators are:



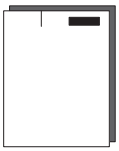
- Adapter ACTIVE (green)
- Adapter FAULT (red)
- LOCAL FAULT (red)

A complete description of the diagnostic indicators and how to use them for troubleshooting is explained in chapter 4.

Reset Pushbutton

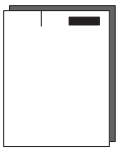
Use the reset pushbutton to reset the adapter module and resume communication when a communication error occurs. (The adapter's processor restart lockout switch (PRL) must be in the "locked out" position.) If the adapter is not locked out by the PRL switch, it will be automatically reset via special commands sent over the communication link.

Important: Do not cycle power to the adapter to clear a fault. All queued block transfer instructions will be lost.



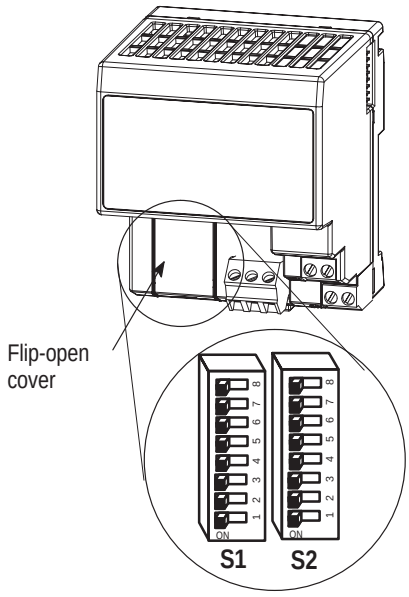
Remote I/O Wiring

The remote I/O wiring termination is made to a plug-in connector on the front of the adapter module. Refer to Chapter 2 for information on wiring the connector.



Power Wiring

Connections are provided for connecting the required 24V dc power to the front of the module. The power wiring can be daisy-chained to the terminal base unit located next to the adapter to supply power to the module installed in that base unit. Wiring information is shown in Chapter 2.



Address Switch Assemblies

Multi-position switches are provided for:

- starting I/O group
- I/O rack number
- hold inputs
- mode switches for mode 0, mode 1 and mode 2
- rack fault
- communication rate
- processor restart lockout (PRL)
- hold last state (outputs)

These switches are accessed by lifting the hinged cover on the front of the module. Refer to Chapter 2 for switch settings.

Chapter Summary

In this chapter you learned about the FLEX I/O system and features of the remote I/O adapter module.

Installing Your Remote I/O Adapter Module

Chapter Objectives

This chapter describes the procedures for installing your remote I/O adapter module. These include:

- power requirements
- mounting the remote I/O adapter
- setting the module switches

European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131–2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Automation Systems Catalog, publication B111

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

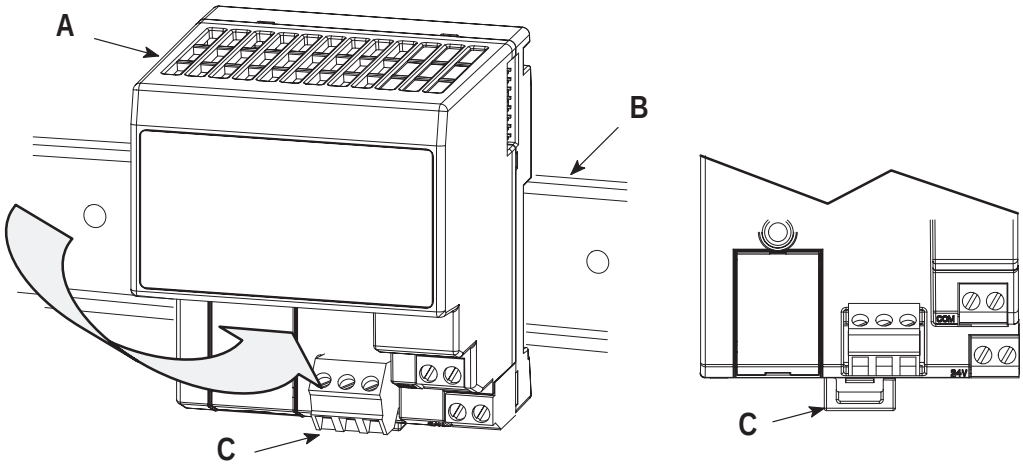
Power Requirements

The Remote I/O adapter module requires a current of 450mA at 24V dc from an external power supply for flexbus operation. This is sufficient to support the flexbus current requirements of 8 modules. Remember to add this amount to current requirements for other modules using the same 24V supply.

Mounting the Remote I/O Adapter

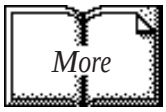
The remote I/O adapter module can be DIN rail or wall/panel mounted. Refer to the specific method of mounting below.

Mounting on a DIN Rail before installing the terminal base units



1. Position the remote I/O adapter module **A** on a 35 x 7.5mm DIN rail **B** (A-B pt. no. 199-DR1; 46277-3; EN 50022) at a slight angle.
2. Rotate the adapter module onto the DIN rail with the top of the rail hooked under the lip on the rear of the adapter module.
3. Press the adapter module down onto the DIN rail until flush. Locking tab **(C)** will snap into position and lock the adapter module to the DIN rail.

   If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail and release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.
4. Connect the adapter wiring as shown under “Wiring” later in this document.



Important: Make certain that the DIN rail is properly grounded to the panel. Refer to “Industrial Automation Wiring and Grounding Guidelines for Noise Immunity,” publication 1770-4.1.

Mounting (or Replacing) the Adapter on an Existing System

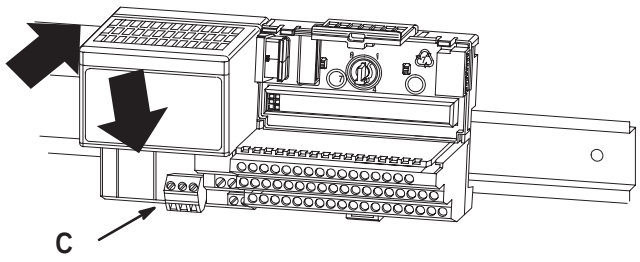
1. Remove the RIO plug-in connector from the front of the adapter.
2. Disconnect any wiring connected to the adjacent terminal base.
3. Using a screwdriver or similar tool, open the lock and remove the module from the base unit to which the adapter will be attached.
4. Push the flexbus connector toward the right side of the terminal base to unplug the backplane connection.

ATTENTION: Make certain that the flexbus connector is completely clear of the adapter. The slide must be completely to the right and the raised spot on the slide visible.

5. Release the locking tab and remove the adapter.
6. Before installing the new adapter, notice the notch on the right rear of the adapter. This notch accepts the hook on the terminal base unit. The notch is open at the bottom. The hook and adjacent connection point keep the terminal base and adapter tight together, reducing the possibility of a break in communication over the backplane.

ATTENTION: Make certain that the hook on the terminal base is properly hooked into the adapter. Failure to lock the hook into the adjacent base/adapter can result in loss of communication on the backplane.

7. Place the adapter next to the terminal base unit and push down to mate the hook into slot.
8. With the hook on the terminal base inside the notch on the adapter, and the lip on the rear of the adapter is hooked over the DIN rail, press in and down to lock the adapter onto the DIN rail.



If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail and release the locking tab **(C)** to lock the adapter module in place. If necessary, push up on the locking tab to lock.

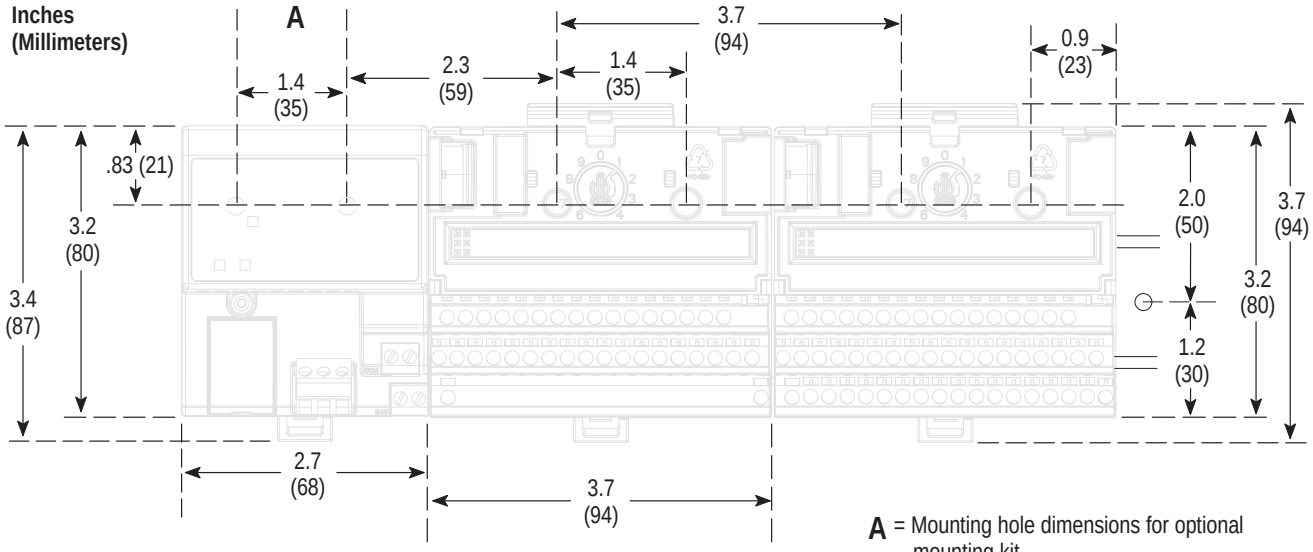
9. **Gently** push the flexbus connector into the side of the adapter to complete the backplane connection.
10. Reinstall the module into the terminal base unit.
11. Reconnect the adapter wiring as shown under “Wiring” later in this document.

Mounting on a Wall or Panel

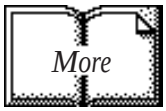
To mount the remote I/O adapter module on a wall or panel, you must have the 1794-NM1 mounting kit. The kit contains a special plate and screws necessary for wall/panel mounting. Proceed as follows:

Install the mounting plate on a wall or panel as follows:

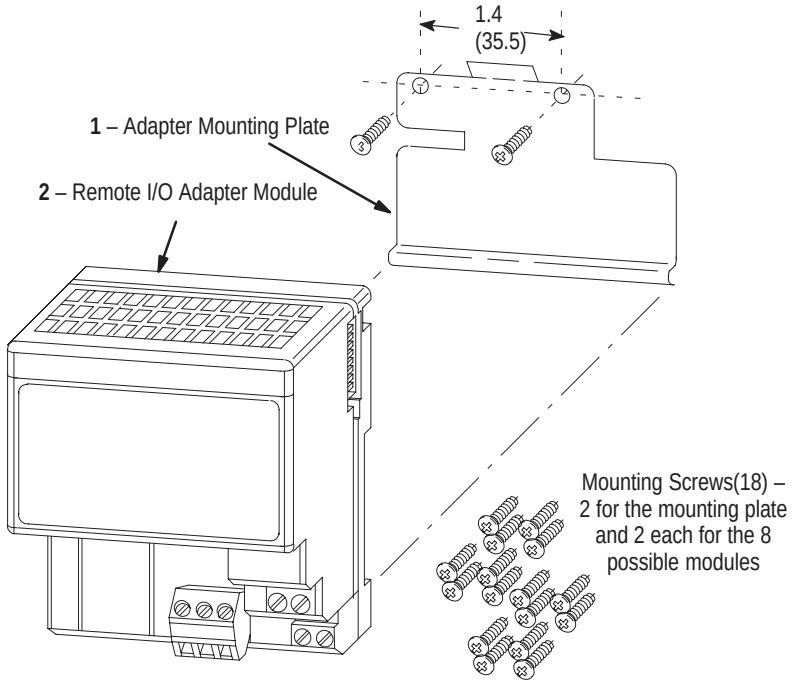
1. Lay out the required points on the wall/panel as shown in the drilling dimension drawing.



2. Drill the necessary holes for #6 self-tapping mounting screws.
3. Mount the mounting plate (1) for the adapter module using two #6 self-tapping screws (18 included).



Important: Make certain that the mounting plate is properly grounded to the panel. Refer to "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity," publication 1770-4.1.

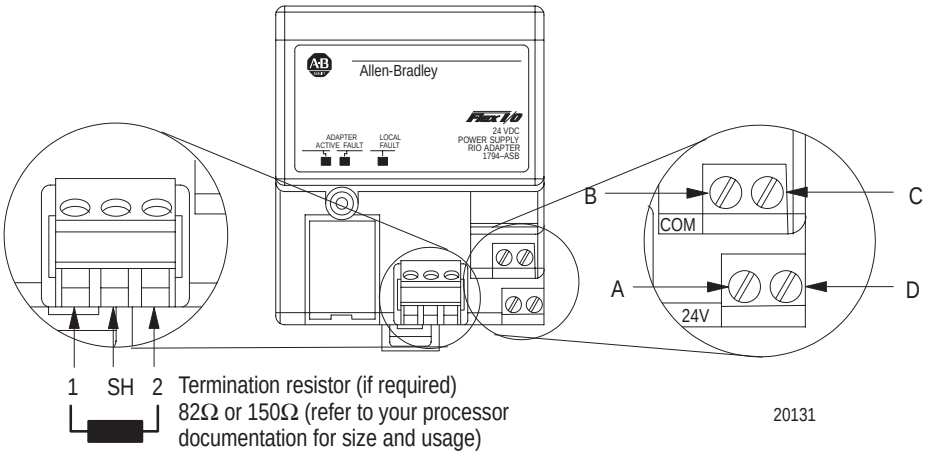


4. Hold the adapter (2) a slight angle and engage the top of the mounting plate in the indention on the rear of the adapter module.
5. Press the module down flush with the panel until the locking lever locks.
6. Position the termination base unit up against the adapter and push the female bus connector into the adapter.
7. Secure to the wall with two #6 self-tapping screws.
8. Repeat for each remaining terminal base unit.

Note: The adapter is capable of addressing eight modules. Do not exceed a maximum of eight terminal base units in your system.

Wiring

Connect external wiring to the remote I/O adapter as shown below.



1. Connect the remote I/O cable to the removable plug-in remote I/O connector.

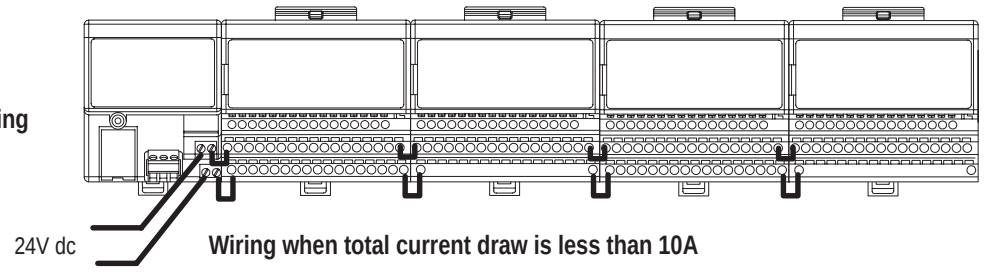
Connect	To
Blue Wire – RIO	1
Shield Wire – RIO	SH
Clear Wire – RIO	2

Note: If this is the last adapter in your FLEX I/O system,.or the last adapter on the remote I/O link, you must use a termination resistor across terminals 1 and 2 on the remote I/O connector. Refer to the information supplied with the processor being used for information on the size of the resistor.

2. Connect +24V dc input to the left side of the lower connector terminal **A**.
3. Connect 24V common to the left side of the upper connector terminal **B**.
4. Connections **C** and **D** are used to pass 24V dc power and common to the next module in the series (if required).

For example:

Daisy-chaining



Wiring when total current draw is less than 10A

Note: Modules must be either all analog or all discrete. Do not mix analog and discrete modules when using the daisy-chain wiring scheme.

Note: Refer to the individual instructions for each module for actual wiring information.

Setting the Switches

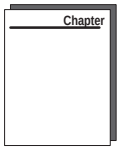
The remote I/O adapter module has two 8-position switch assemblies which you set for:

- starting I/O group
- I/O logical rack number
- hold inputs
- addressing modes
- last chassis
- communication rate
- processor restart lockout (PRL)
- hold last state (outputs)

ATTENTION: The switch settings on the series C adapter are not the same as on the series A and series B adapter. If you are replacing an earlier series adapter with this series C adapter, make certain that the switches are set correctly for your application.

Starting I/O Group

An I/O group is an addressing unit that can contain up to 16 input terminals and 16 output terminals. The **starting I/O group** is the first group of input and output circuits that correspond to one word in both the input and output image tables. These starting I/O groups are numbered 0, 2, 4 and 6. The number of modules that make up an I/O group varies with the mode of addressing.



I/O Rack Number

One logical I/O rack is 8 I/O groups. You cannot have more than 1 rack number per adapter. Refer to “Determining Rack Size” on page 3–13 for examples.

Hold Inputs

When hold inputs is enabled (S2-7 on), the adapter will retain the last memory image present when you remove a discrete input module from its base. These inputs are held until the correct module is placed back in the base. If the same type of module is reinserted into the base, its inputs will be transferred. If a different type of module is inserted in the base, its memory image will go to zero. Any associated outputs will also go to zero.

Rack Fault Select Switch (RFS)

The rack fault select allows the user to determine what action the adapter takes if communication is lost with one or more I/O modules

ATTENTION: If an I/O module stops responding to the adapter due to a module being removed under power, a problem with the flexbus, or a problem with an I/O module, the adapter declares a Local fault.

When RFS is disabled (S2–6 on), module removal and insertion under power (RIUP) is possible. If an I/O module stops responding, the adapter declares a local fault and flashes the Local Fault indicator. The adapter also resets the output data (if any) for the module not responding. All other modules remain active.

When the RFS is enabled (S2-6 off), communication error detection is extended to the I/O module level. If an I/O module stops responding, the adapter declares a local fault, flashes the Local Fault indicator and causes the scanner to declare a Rack Fault. The adapter resets the output data (if any) for the module not responding and commands all other outputs to go to the state determined by the Hold Last State switch (S2–1).

ATTENTION: Module removal and insertion under power (RIUP) will cause a rack fault when Rack Fault Select is enabled.

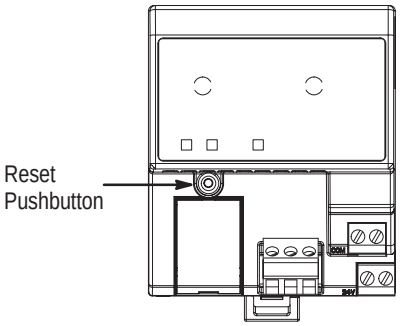
Addressing Mode Selection Switches

The 3 addressing mode switches are used to select the addressing modes of the adapter: standard, 8-pt compact, 16-pt compact, 8-pt complementary, and 16-pt complementary. Refer to the table on page 2–11 for information on the interaction of these switches.

Mode switch S1-1 provides different functions. In standard mode, it acts as part of the rack address, providing backward compatibility with the series A or B adapters. In compact mode, it determines 8 or 16-point density. In complementary mode, it specifies whether the rack has a complementary rack at the same address.

Communication Rate

You set these switches (S2-3 and S2-4) for the desired communication rate (in bits/s). Selections are:
57.6k bits/s
115.2k bits/s
230.4k bits/s



Processor Restart Lockout (PRL)

When PRL is disabled (switch S2-2 on), the programmable controller can restart communication with the adapter in the event of a communication fault.

When PRL is enabled (switch S2-2 off), the programmable controller cannot restart communication with the adapter in the event of a communication fault. In this case, you must press the restart pushbutton on the front of the adapter module to restart communication.

Hold Last State (HLS)

The hold last state option allows the user to determine what action the outputs take in the event of a communication error.

When HLS is enabled (S2–1 off), all digital outputs, and 1794-OE4 and 1794-IE4XOE2 analog modules remain in their last state. All other analog outputs take their configured safe state action

When HLS is disabled (S2–1 on), all digital outputs are reset. All analog outputs take their configured safe state action

ATTENTION: Only 1794-OE4 and 1794-IE4XOE2 analog modules hold their last state when Hold Last State is enabled. Refer to the respective module publcations for information about configuring analog output safe state actions.

The switch assemblies are located under a flip-open cover on the front of the adapter module.

Starting I/O Group		
S1–8	**S1–7**	**I/O group**
ON	ON	0 (1st quarter)
OFF	ON	2 (2nd quarter)
ON	OFF	4 (3rd quarter)
OFF	OFF	6 (4th quarter)

I/O Rack Number
S1–6 thru S1–1
Refer to page 2–11

S2–8	Mode Switch 0
Refer to Mode Selection Switches, 2–11	

S2–7	Hold Inputs
ON	Hold Inputs
OFF	Reset Inputs

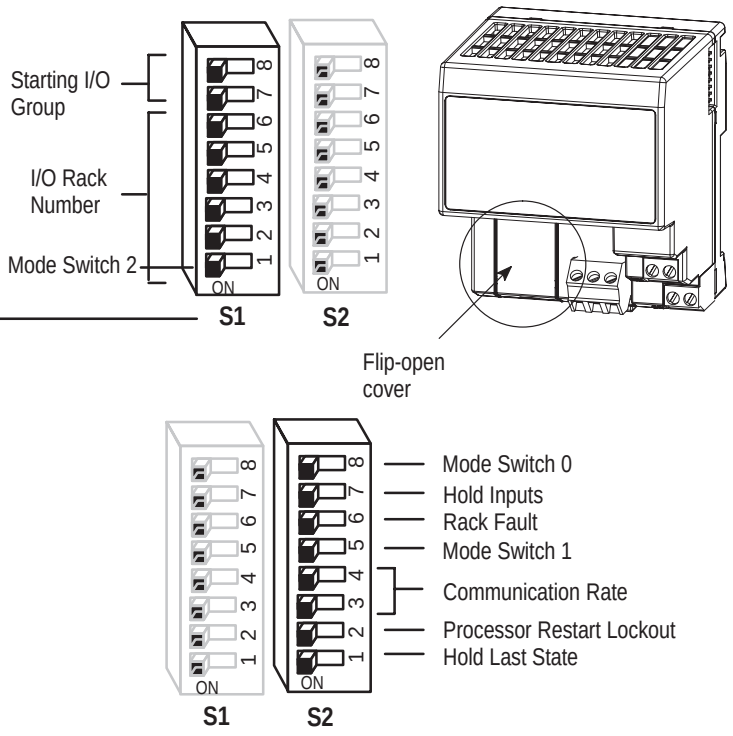
S2–6	Rack Fault
ON	Not Enabled (default)
OFF	Enabled

S2–5	Mode Switch 1
Refer to Mode Selection Switches, 2–11	

Communication Rate		
S2–4	**S2–3**	**Bits/s**
ON	ON	57.6k
OFF	ON	115.2k
ON	OFF	230.4k
OFF	OFF	230.4k

Processor Restart Lockout (PRL)	
S2–2	**Processor:**
ON	Restart
OFF	Locked out

Hold Last State (HLS)	
S2–1	**Processor will:**
ON	Reset outputs
OFF	Hold last state



Setting the Mode Selection Switches

Set the mode selection switches for the desired mode as follows.

1. Lift the hinged switch cover on the front of the adapter to expose the switches.
2. Set the switches as shown below.
3. Cycle power to the adapter to activate the settings.

When Using this Addressing Mode	And	Mode Switch 2 S1-1	Mode Switch 1 S2-5	Mode Switch 0 S2-8
Standard	8 and/or 16- point modules	See note 1	ON	ON
Compact	8-point modules	OFF	ON	OFF
	16-point modules	ON	ON	OFF
Complementary	See Complementary Rack Addressing Table, page 2–13			
Primary chassis	8-point modules	OFF	OFF	ON
Complementary chassis		ON	OFF	ON
Complementary	See Complementary Rack Addressing Table, page 2–13			
Primary chassis	16-point modules[2]	OFF	OFF	OFF
Complementary chassis		ON	OFF	OFF

[1] In standard mode, this switch retains its function as switch position 1 of rack addressing. In Standard mode, the module acts like a 1794-ASB/B module.
[2] When programming block transfers, address analog modules as module 0 if switch S1-1 is on; module 1 if switch S1-1 is off.

Setting the Address Switches

Use the following table to set your address switches.

Rack Number				S1 Switch Position					
1747-SN	PLC-5	PLC-5/250	PLC-3	6	5	4	3	2	1
Rack 0	Not Valid	Rack 0	Rack 0	ON	ON	ON	ON	ON	ON
Rack 1	Rack 1	Rack 1	Rack 1	OFF	ON	ON	ON	ON	ON
Rack 2	Rack 2	Rack 2	Rack 2	ON	OFF	ON	ON	ON	ON
Rack 3	Rack 3	Rack 3	Rack 3	OFF	OFF	ON	ON	ON	ON
	Rack 4	Rack 4	Rack 4	ON	ON	OFF	ON	ON	ON
	Rack 5	Rack 5	Rack 5	OFF	ON	OFF	ON	ON	ON
	Rack 6	Rack 6	Rack 6	ON	OFF	OFF	ON	ON	ON
	Rack 7	Rack 7	Rack 7	OFF	OFF	OFF	ON	ON	ON
	Rack 10	Rack 10	Rack 10	ON	ON	ON	OFF	ON	ON
	Rack 11	Rack 11	Rack 11	OFF	ON	ON	OFF	ON	ON
	Rack 12	Rack 12	Rack 12	ON	OFF	ON	OFF	ON	ON
	Rack 13	Rack 13	Rack 13	OFF	OFF	ON	OFF	ON	ON
	Rack 14	Rack 14	Rack 14	ON	ON	OFF	OFF	ON	ON
	Rack 15	Rack 15	Rack 15	OFF	ON	OFF	OFF	ON	ON
	Rack 16	Rack 16	Rack 16	ON	OFF	OFF	OFF	ON	ON
	Rack 17	Rack 17	Rack 17	OFF	OFF	OFF	OFF	ON	ON

Continued on next page

Rack Number				S1 Switch Position					
1747-SN	PLC-5	PLC-5/250	PLC-3	6	5	4	3	2	1
	Rack 20	Rack 20	Rack 20	ON	ON	ON	ON	OFF	ON
	Rack 21	Rack 21	Rack 21	OFF	ON	ON	ON	OFF	ON
	Rack 22	Rack 22	Rack 22	ON	OFF	ON	ON	OFF	ON
	Rack 23	Rack 23	Rack 23	OFF	OFF	ON	ON	OFF	ON
	Rack 24	Rack 24	Rack 24	ON	ON	OFF	ON	OFF	ON
	Rack 25	Rack 25	Rack 25	OFF	ON	OFF	ON	OFF	ON
	Rack 26	Rack 26	Rack 26	ON	OFF	OFF	ON	OFF	ON
	Rack 27	Rack 27	Rack 27	OFF	OFF	OFF	ON	OFF	ON
		Rack 30	Rack 30	ON	ON	ON	OFF	OFF	ON
		Rack 31	Rack 31	OFF	ON	ON	OFF	OFF	ON
		Rack 32	Rack 32	ON	OFF	ON	OFF	OFF	ON
		Rack 33	Rack 33	OFF	OFF	ON	OFF	OFF	ON
		Rack 34	Rack 34	ON	ON	OFF	OFF	OFF	ON
		Rack 35	Rack 35	OFF	ON	OFF	OFF	OFF	ON
		Rack 36	Rack 36	ON	OFF	OFF	OFF	OFF	ON
		Rack 37	Rack 37	OFF	OFF	OFF	OFF	OFF	ON
See note 1 – Rack addresses 40 thru 76 are only available in standard mode			Rack 40	ON	ON	ON	ON	ON	OFF
			Rack 41	OFF	ON	ON	ON	ON	OFF
			Rack 42	ON	OFF	ON	ON	ON	OFF
			Rack 43	OFF	OFF	ON	ON	ON	OFF
			Rack 44	ON	ON	OFF	ON	ON	OFF
			Rack 45	OFF	ON	OFF	ON	ON	OFF
			Rack 46	ON	OFF	OFF	ON	ON	OFF
			Rack 47	OFF	OFF	OFF	ON	ON	OFF
			Rack 50	ON	ON	ON	OFF	ON	OFF
			Rack 51	OFF	ON	ON	OFF	ON	OFF
			Rack 52	ON	OFF	ON	OFF	ON	OFF
			Rack 53	OFF	OFF	ON	OFF	ON	OFF
			Rack 54	ON	ON	OFF	OFF	ON	OFF
			Rack 55	OFF	ON	OFF	OFF	ON	OFF
			Rack 56	ON	OFF	OFF	OFF	ON	OFF
			Rack 57	OFF	OFF	OFF	OFF	ON	OFF

Continued on next page

Rack Number				S1 Switch Position					
1747-SN	PLC-5	PLC-5/250	PLC-3	6	5	4	3	2	1
			Rack 60	ON	ON	ON	ON	OFF	OFF
			Rack 61	OFF	ON	ON	ON	OFF	OFF
			Rack 62	ON	OFF	ON	ON	OFF	OFF
			Rack 63	OFF	OFF	ON	ON	OFF	OFF
			Rack 64	ON	ON	OFF	ON	OFF	OFF
			Rack 65	OFF	ON	OFF	ON	OFF	OFF
			Rack 66	ON	OFF	OFF	ON	OFF	OFF
			Rack 67	OFF	OFF	OFF	ON	OFF	OFF
			Rack 70	ON	ON	ON	OFF	OFF	OFF
			Rack 71	OFF	ON	ON	OFF	OFF	OFF
			Rack 72	ON	OFF	ON	OFF	OFF	OFF
			Rack 73	OFF	OFF	ON	OFF	OFF	OFF
			Rack 74	ON	ON	OFF	OFF	OFF	OFF
			Rack 75	OFF	ON	OFF	OFF	OFF	OFF
			Rack 76	ON	OFF	OFF	OFF	OFF	OFF
			Not Valid	OFF	OFF	OFF	OFF	OFF	OFF

Rack address 77 is an illegal configuration.
PLC-5/11 processors can scan rack 03.
PLC-5/15 and PLC-5/20 processors can scan racks 01–03.
PLC-5/25 and PLC-5/30 processors can scan racks 01–07.
PLC-5/40 and PLC-5/40L processors can scan racks 01–17.
PLC-5/60 and PLC-5/60L processors can scan racks 01–27.
PLC-5/250 processors can scan racks 00–37.
PLC-3 processors can scan racks 00–76.
Note 1 – When using a 1794-ASB series C adapter module, rack addresses 40 to 76 are only available in Standard mode.

Setting the Address Switches for Complementary I/O

Use the following table to set your address switches for complementary I/O when using a PLC-5 processor. For all other processors, refer to the programming manual for that specific processor.

Primary Rack

Rack Number		S1 Switch Position					
1747-SN	PLC-5	6	5	4	3	2	1
Rack 0	Not Valid	ON	ON	ON	ON	ON	OFF
Rack 1	Rack 1	OFF	ON	ON	ON	ON	OFF
Rack 2	Rack 2	ON	OFF	ON	ON	ON	OFF
Rack 3	Rack 3	OFF	OFF	ON	ON	ON	OFF
	Rack 4	ON	ON	OFF	ON	ON	OFF
	Rack 5	OFF	ON	OFF	ON	ON	OFF
	Rack 6	ON	OFF	OFF	ON	ON	OFF
	Rack 7	OFF	OFF	OFF	ON	ON	OFF

Complementary Rack

Rack Number		S1 Switch Position					
1747-SN	PLC-5	6	5	4	3	2	1
Rack 0	Not Valid	ON	ON	ON	OFF	ON	ON
Rack 1	Rack 1	OFF	ON	ON	OFF	ON	ON
Rack 2	Rack 2	ON	OFF	ON	OFF	ON	ON
Rack 3	Rack 3	OFF	OFF	ON	OFF	ON	ON
	Rack 4	ON	ON	OFF	OFF	ON	ON
	Rack 5	OFF	ON	OFF	OFF	ON	ON
	Rack 6	ON	OFF	OFF	OFF	ON	ON
	Rack 7	OFF	OFF	OFF	OFF	ON	ON

Chapter Summary

In this chapter you learned how to install your adapter module and set your switches. Chapter 3 tells you how to communicate with your system.

Communicating with FLEX I/O Modules

Chapter Objectives

In this chapter, we tell you about:

- FLEX I/O module data
- selecting an addressing type
- selecting an addressing mode
- determining rack size
- mapping data into the image tables
- operating modes

FLEX I/O Module Data

There are 2 types of data associated with FLEX I/O modules: input data and output data.

- input data – data read from the module by the processor
- output data – data written to the module by the processor

Some digital I/O modules have both input and output data associated with them. Digital I/O modules map input data and output data to the input and output image tables in the processor. Input and output data can be defined as:

- real I/O data – data that represents the actual state of hardwired inputs and outputs (input data on input modules, output data on output modules)
- configuration/status data – data written to configure the module (such as delay times); and status information (such as a fuse blown indication)

For FLEX analog modules, input and output data is only accessible by the processor using block transfer instructions. The data is contained in block transfer write (BTW) and block transfer read (BTR) data files, **not** in the input and output image tables. A byte of input image and a byte of output image **is** required for the module status byte (MSB) and the module control byte (MCB). The MSB uses input image, and the MCB uses output image. These bytes are required for block transfer command communications.

Addressing I/O

The 1794-ASB series C adapter supports 3 different modes of addressing: standard, compact and complementary.

For digital modules, the type of addressing determines what type of data is available to the processor from the module.

- standard addressing – input **and** output data is available for each digital module connected to the adapter
- compact addressing – either input **or** output data (not both) is available for each digital module connected to the adapter
- complementary addressing – either input **or** output data (not both) is available for each digital module connected to the adapter

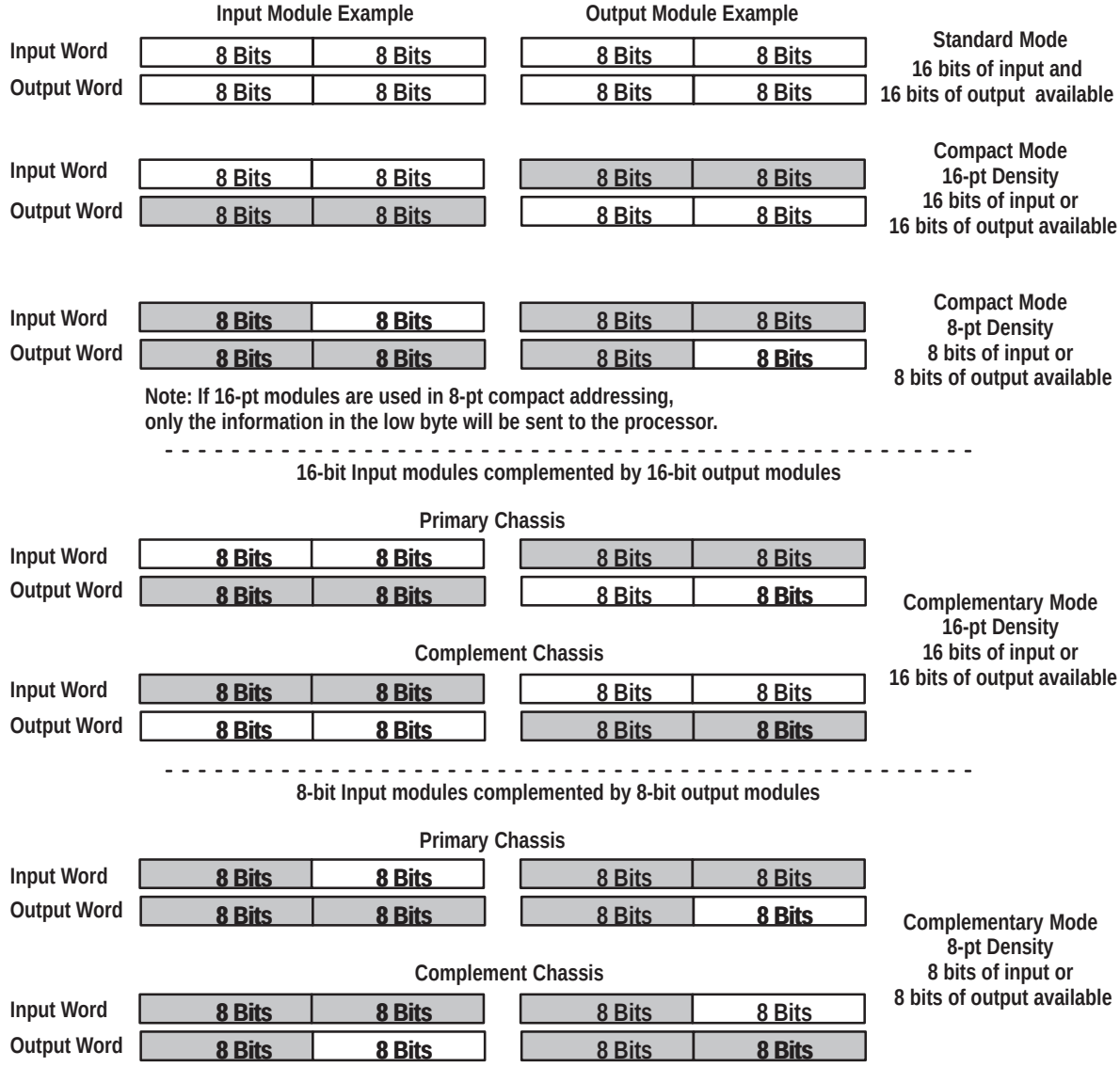
Analog modules can be used in any type of addressing with no loss of data because data is not stored in the input and output image table. Analog data is stored in BTW and BTR data files.

The following table helps you to select an addressing type based on the kind of modules you want to use, and the features you need from those modules. The table also lists both advantages and disadvantages of using each addressing type.

Addressing Mode	Use this addressing scheme when:	Advantages	Disadvantages
Standard	• you need full FLEX I/O module functionality, including combination modules (1794-IB10XOB6), settable input delay times on input modules (1794-IB16, -IB8S), and fuse blown indication (1794-OB8EP) for example.	• User has access to 1 word of input, 1 word of output for each digital module. • Eight modules equal 1 logical rack. • No restrictions on module placement • Maximum use of configuration/status and combination modules	• Inefficient I/O image table utilization
Compact	• you **don't** need full FLEX I/O module functionality, including combination modules (1794-IB10XOB6), settable input delay times on input modules (1794-IB16, -IB8S), and fuse blown indication (1794-OB8EP), for example. • you can locate equal numbers of input and output modules in a single chassis	• Eight 8 point modules equal 1/4 logical rack • Eight 16 point modules equal 1/2 logical rack • Provides maximum use of I/O image table by a single FLEX chassis (when input and output modules are installed in alternate slots.	• You must configure all modules in the chassis as either 8 point or 16 point. • No combination modules allowed • Configuration/status data is not accessible to user
Complementary	• you **don't** need full FLEX I/O module functionality, including combination modules (1794-IB10XOB6), settable input delay times on input modules (1794-IB16, -IB8S), and fuse blown indication (1794-OB8EP), for example. • you can locate equal numbers of input and output modules in separate chassis	• Eight 8 point modules in each chassis equal 1/2 logical rack • Eight 16 point modules in each chassis equal 1 logical rack • Provides maximum use of I/O image table in 2 FLEX chassis (when input modules are installed in 1 chassis, and output modules are installed in the complementary chassis.	• You must configure all modules in both chassis as either 8 point or 16 point. • No combination modules allowed • Configuration/status data is not accessible to user

The amount of data accessible to the processor in the 3 addressing modes is illustrated below. Note that the shaded areas represent data not accessible by the processor.

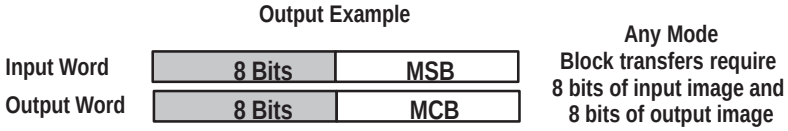
Digital I/O Modules



Note: Shaded areas represent data not accessible by the processor.

Analog modules use block transfers, which require 1 byte (8 bits) of input image for the module status byte, and 1 byte (8 bits) of output image for the module control byte. This is true for any addressing mode selected.

Analog (Block Transfer) Modules



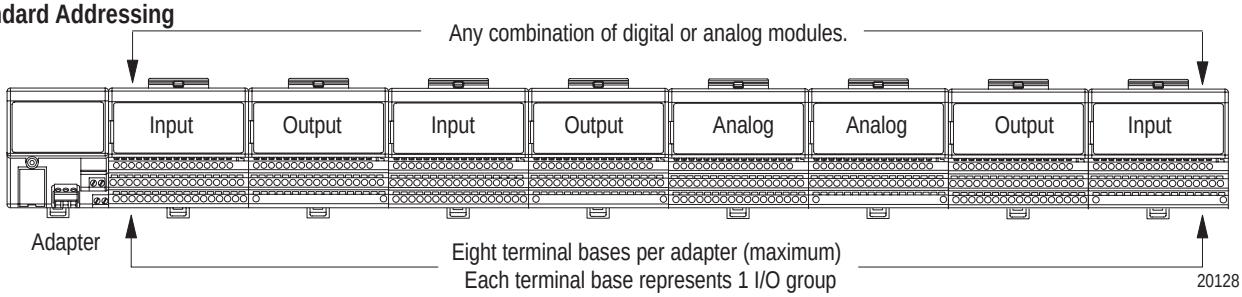
Standard Addressing

Use standard addressing when:

- you need full FLEX I/O module functionality, such as delay time selection on input modules, fuse-blown indication on the 1794-OB8EP, etc.
- using combination modules, such as the 1794-IB10XOB6 10 in/6 out module

In standard mode, each module position equals one I/O group – 1 word of input image and 1 word of output image.

Standard Addressing



Standard Addressing Example – 8 modules = 1 logical rack

	I/O Group 0		I/O Group 1		I/O Group 2		I/O Group 3		I/O Group 4		I/O Group 5		I/O Group 6		I/O Group 7	
	M0		M1		M2		M3		M4		M5		M6		M7	
ASB/C	IH	IL	IH	IL	IH	IL	IH	IL		MSB		MSB	IH	IL	IH	IL
	OH	OL	OH	OL	OH	OL	OH	OL		MCB		MCB	OH	OL	OH	OL
	IB16		OB16		IB16		OB16		IE8		IE8		OB16		IB16	

IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

MCB = Module Control Byte (output data)
MSB = Module Status Byte (input data)

Legal Module Placement in Standard Addressing
Any module in any slot

1 module position is an I/O group

Input Image Table

I/O Group	17 10	07 00
0	M0-IH	M0-IL
1	M1-IH	M1-IL
2	M2-IH	M2-IL
3	M3-IH	M3-IL
4		M4-MSB
5		M5-MSB
6	M6-IH	M6-IL
7	M7-IH	M7-IL

Output Image Table

17 10	07 00
M0-OH	M0-OL
M1-OH	M1-OL
M2-OH	M2-OL
M3-OH	M3-OL
	M4-MCB
	M5-MCB
M6-OH	M6-OL
M7-OH	M7-OL

Compact Addressing

Use compact addressing when:

- you are not using combination modules
- you are using only digital input, digital output and analog modules
- you don't need all the features of digital FLEX I/O modules (You can only access the input word on an input module, or the output word of an output module. Any status information/configuration information in the corresponding input/output word is not accessible.)
- you can locate equal numbers of input and output modules in a single chassis
- you want more efficient use of the input/output data table

Compact Mode

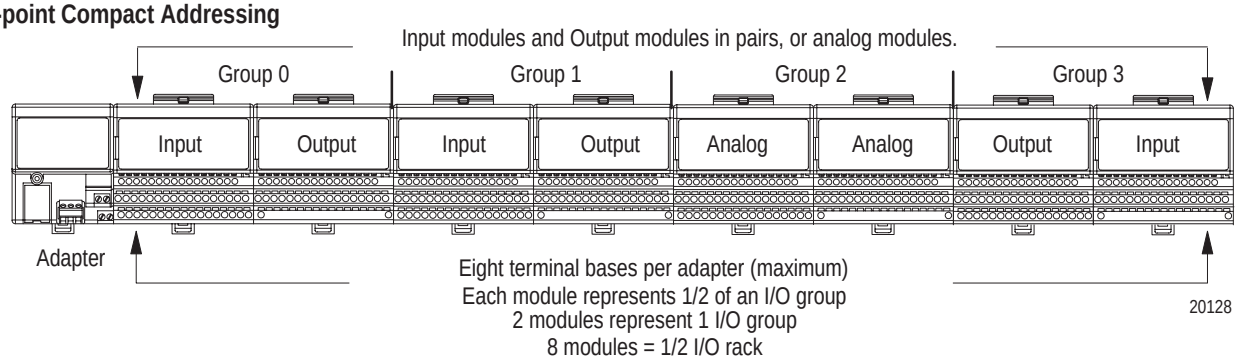
Compact mode maximizes single chassis I/O image table usage when using either 8- or 16-point modules and block transfer modules.

Compact mode allows more than 1 module to occupy a single I/O group. How many modules depends on the density selected (16- or 8-point).

In compact mode, with 16-point density, 2 digital modules (1 input and 1 output module) can occupy 1 I/O group. In addition, 2 block transfer modules can occupy 1 I/O group.

In compact mode, with 8-point density, 4 digital modules (2 input and 2 output modules) can occupy 1 I/O group. In addition, 2 block transfer modules can occupy 1 I/O group.

16-point Compact Addressing



Compact 16-point Addressing Example – 8 modules = 1/2 logical rack

	I/O Group 0				I/O Group 1				I/O Group 2				I/O Group 3			
	M0		M1		M2		M3		M4		M5		M6		M7	
ASB/C	IH	IL			IH	IL				MSB		MSB			IH	IL
			OH	OL			OH	OL		MCB		MCB	OH	OL		
	IB16		OB16		IB16		OB16		IE8		IE8		OB16		IB16	

IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

MCB = Module Control Byte (output data)
MSB = Module Status Byte (input data)

Legal Module Placement in 16-pt Compact Addressing
A 16-point input module and a 16-point output module in an I/O group

2 module positions = an I/O group

Note: Shaded areas represent unavailable data

Input Image Table

I/O Group	17 10	07 00
0	M0-IH	M0-IL
1	M2-IH	M2-IL
2	M5-MSB	M4-MSB
3	M7-IH	M7-IL
4		
5		
6		
7		

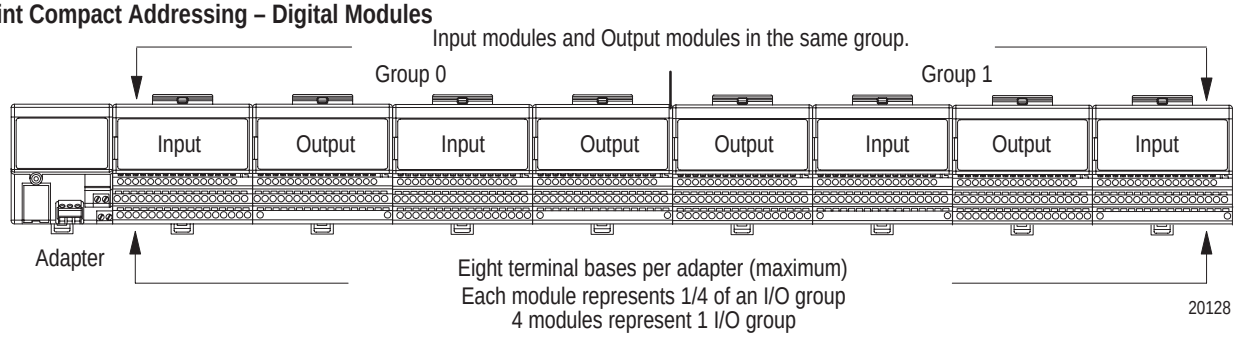
Output Image Table

17 10	07 00
M1-OH	M1-OL
M3-OH	M3-OL
M5-MCB	M4-MCB
M6-OH	M6-OL

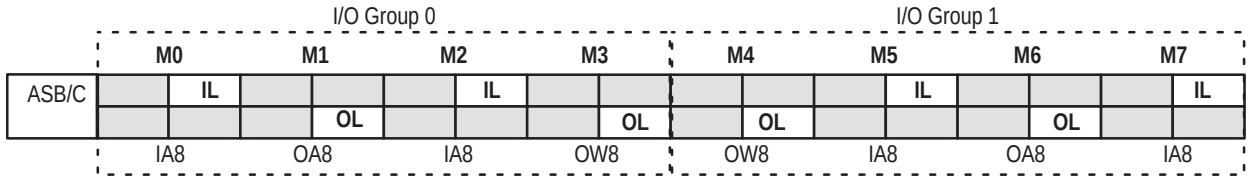
I/O groups 4–7 are available for another adapter.

Note: When using block transfer modules in 16-pt compact addressing, address module positions M0, M2, M4 and M6 as module "0" in a block transfer instruction block; address module positions M1, M3, M5 and M7 as module "1" in a block transfer instruction block.

8-point Compact Addressing – Digital Modules



Compact 8-point Addressing Example – 8 digital modules = 1/4 logical rack



IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

Legal Module Placement in 8-point Compact Addressing
Two 8-point input modules and two 8-point output modules in an I/O group
Module type must alternate within an I/O group: input, output, etc.

4 module positions to an I/O group

Note: Shaded areas represent unavailable data

Input Image Table

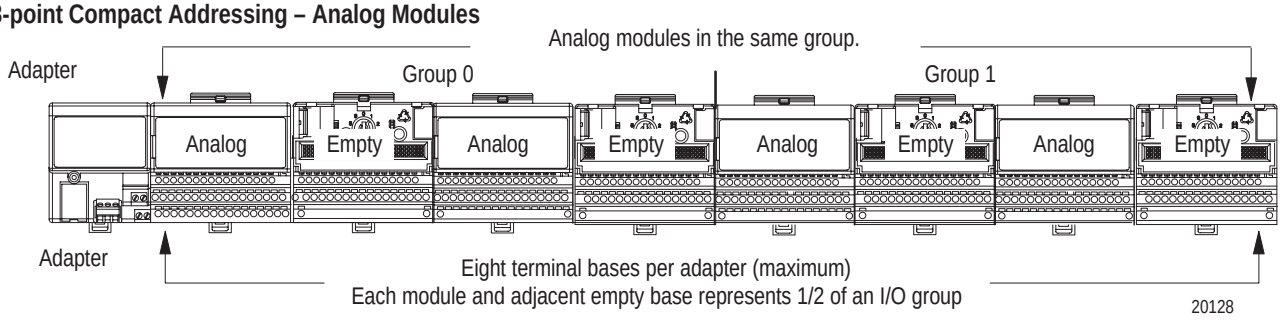
I/O Group	17 10	07 00
0	M2-IL	M0-IL
1	M7-IL	M5-IL
2		
3		
4		
5		
6		
7		

Output Image Table

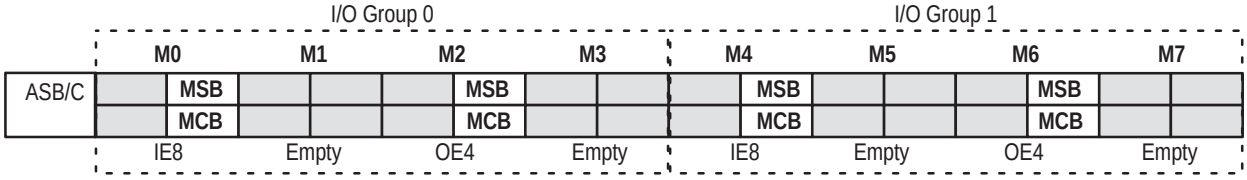
17 10	07 00
M3-OL	M1-OL
M6-OL	M4-OL

I/O groups 2–7 are available to additional adapters.

8-point Compact Addressing – Analog Modules



Compact 8-point Addressing Example – 4 block transfer modules = 1/4 logical rack



IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

MCB = Module Control Byte (output data)
MSB = Module Status Byte (input data)

NOTE: 2 Block transfer modules and their adjacent empty base = 1 I/O group. An empty slot must accompany each BT module in 8-point compact addressing.

Note: Shaded areas represent unavailable data

Input Image Table

I/O Group	17 10	07 00
0	M2-MSB	M0-MSB
1	M6-MSB	M4-MSB
2		
3		
4		
5		
6		
7		

Output Image Table

17 10	07 00
M2-MCB	M0-MCB
M6-MCB	M4-MCB

I/O groups 2–7 are available to additional adapters.

Note: In the above example, address module positions M0, M1, M4 and M5 as module “0” in a block transfer instruction block; address module positions M2, M3, M6 and M7 as module “1” in a block transfer instruction block.

Complementary Addressing Mode

Use complementary addressing when:

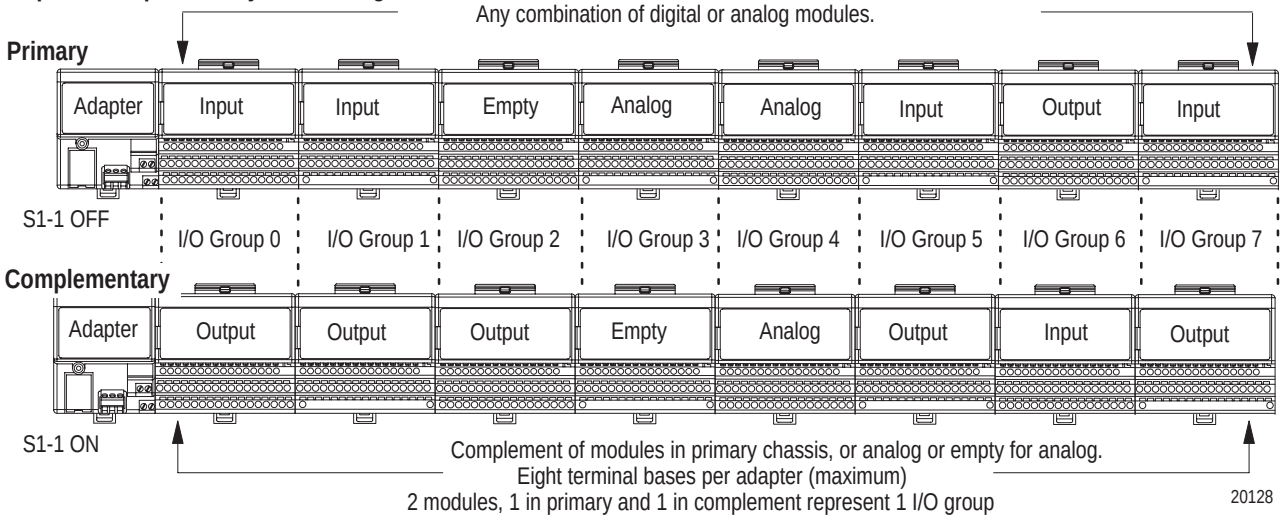
- you are not using combination modules
- you don't need all the features of FLEX I/O modules
- you can locate equal numbers of input and output modules in separate chassis
- you want more efficient use of the input/output image table

Complementary Mode

Complementary mode maximizes 2 chassis I/O image table usage when input modules are installed in 1 chassis, and output modules are installed in another chassis. This mode allows 2 modules to occupy a single I/O group.

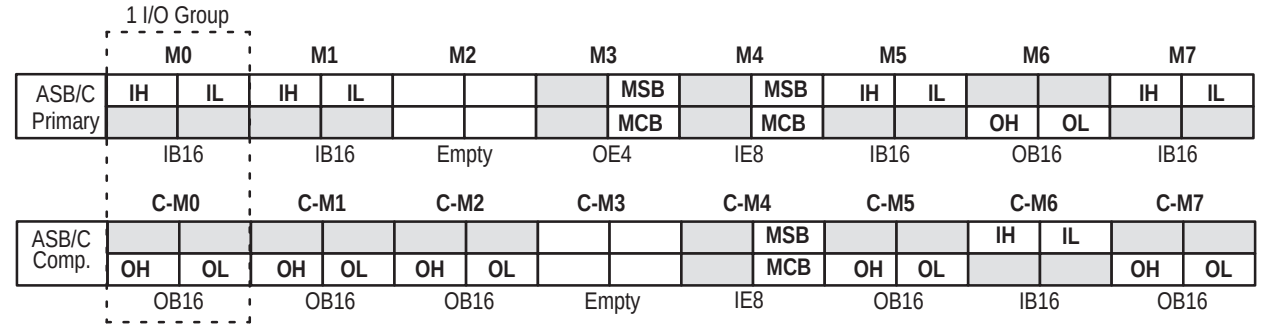
In complementary mode, with 16-point density, 1 digital input module in the primary chassis, and 1 digital output module in the complementary chassis, or vice versa, form an I/O group. In addition, analog modules can be complemented by another analog module or an empty base.

16-point Complementary Addressing



Note: When programming block transfers, address analog modules as module 0 if switch S1-1 is on; module 1 if switch S1-1 is off.

Complementary 16-point Addressing Example – Up to 16 modules = 1 logical rack



IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

MCB = Module Control Byte
MSB = Module Status Byte

Legal Module Placement in 16-point Complementary
Any module in any I/O position of the primary chassis, input modules complemented by output modules, analog modules complemented by analog modules or empty base

Note: Shaded areas represent unavailable data

Input Image Table

I/O Group	17 10	07 00
0	M0-IH	M0-IL
1	M1-IH	M1-IL
2		
3	M3-MSB	
4	M4-MSB	C-M4-MSB
5	M5-IH	M5-IL
6	C-M6-IH	C-M6-IL
7	M7-IH	M7-IL

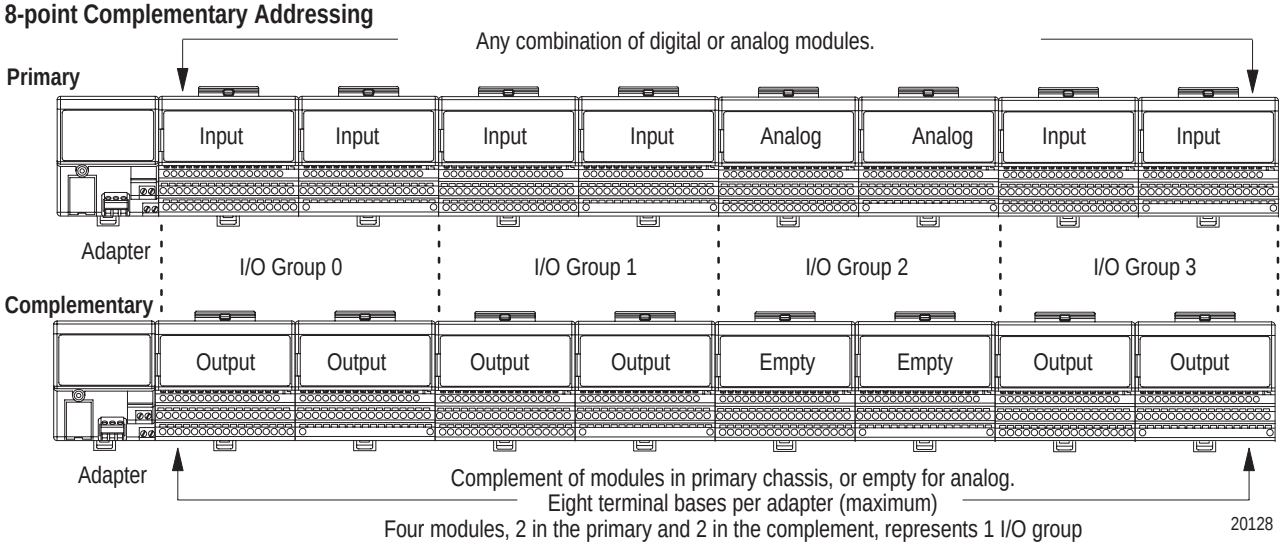
Output Image Table

17 10	07 00
C-M0-OH	C-M0-OL
C-M1-OH	C-M1-OL
C-M2-OH	C-M2-OL
M3-MCB	
M4-MCB	C-M4-MCB
C-M5-OH	C-M5-OL
M6-OH	M6-OL
C-M7-OH	C-M7-OL

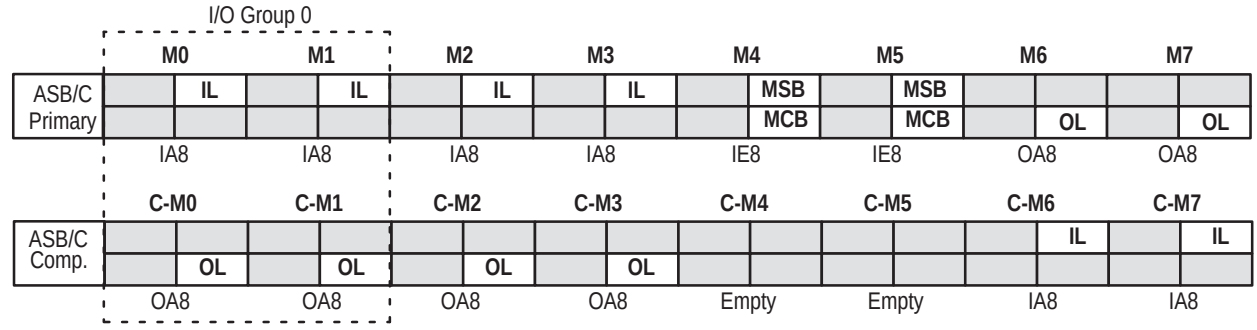
Note: When programming block transfer instructions, address analog modules in the primary rack as module "0," and analog modules in the complementary rack as module "1."

In complementary mode, with 8-point density, 2 digital input modules in the primary chassis, and 2 digital output modules in the complementary chassis, or vice versa, form an I/O group. In addition, analog modules must be complemented by an empty base.

8-point Complementary Addressing



Complementary 8-point Addressing Example – up to 16 modules = 1/2 logical rack



IL = Input Low Byte
IH = Input High Byte
OL = Output Low Byte
OH = Output High Byte

MCB = Module Control Byte
MSB = Module Status Byte

Legal Module Placement in 8-point Complementary

2 inputs in a group complemented by 2 outputs
2 outputs in a group complemented by 2 inputs
2 block transfer modules complemented by 2 empty slots
1 block transfer module and 1 input in a group complemented by 1 empty slot and 1 output module

Note: Shaded areas represent unavailable data

Input Image Table

I/O Group	17 10	07 00
0	M1-IL	M0-IL
1	M3-IL	M2-IL
2	M5-MSB	M4-MSB
3	C-M7-IL	C-M6-IL
4		
5		
6		
7		

Output Image Table

17 10	07 00
C-M1-OL	C-M0-OL
C-M3-OL	C-M2-OL
M5-MCB	M4-MCB
M7-OL	M6-OL

I/O groups 4–7 are available to additional adapters.

Note: When programming, address analog modules as module "0" for all even numbered module positions; and address analog modules as module "1" for all odd numbered module positions.

Mapping Data into the Image Tables

After the rack size has been determined by the remote I/O adapter, the data from the modules must be mapped into the data tables. Data associated with digital modules is mapped into the input and output image table.

Data transfer to and from the remote I/O adapter and digital modules occurs every flexbus scan. This data is mapped into the input/output image table.

Important: The switch settings on the adapter module determine whether both the input and output bits are transferred. Standard addressing is the only mode that maps both input and output bits for each module.

For analog modules, only the MSB and MCB block transfer bytes are mapped into the input and output image table. The remote I/O adapter transfers data to analog I/O modules (block transfer write) and from analog I/O modules (block transfer read) using BTW and BTR instructions in your ladder diagram program. This data is mapped to the data files selected in the ladder logic block transfer instructions.

The adapter identifies the type of module in each base unit at powerup, and stores this information for later use, if necessary.

Important: If you are changing your configuration, you must power down, then power back up after changing a module type in a terminal base unit.

ATTENTION: In Standard Addressing Mode, FLEX I/O modules do not support complementary I/O. Do not attempt to use the complementary image table word of a module in Standard Addressing Mode. The complementary word is reserved for use by the module.

ATTENTION: Do not use the auto-config feature of 6200 software when using a PLC-3 processor with 1775-S4A or 1775-S4B scanner modules. If you do an auto-config for a scanner channel containing 1 or more 1794-ASB adapters with that configuration, the adapters may not show up in the scan list for that scanner channel. Manually insert these adapters into the scan list for the scanner.

ATTENTION: If the adapter is powered up before analog modules, the adapter will not recognize the analog module. Make certain that analog modules are installed and powered up before or simultaneously with the remote I/O adapter. If the adapter does not establish communication with the analog module, cycle power to the adapter.

Determining Rack Size

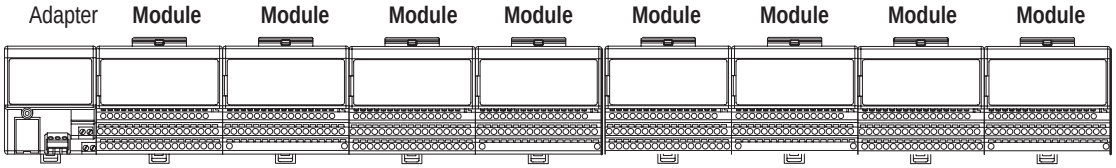
After the remote I/O adapter has identified the modules present in its system, it creates a "rack image" so data transfer can take place using the remote I/O protocol.

Building a rack image consists of:

- mapping each module to an I/O group (16 bits of input and 16 bits of output)
- determining rack size – all empty terminal bases are counted unless they occur at the end of the rack
- automatically sizing the rack image, based upon the mode switch setting
- smallest rack size is 1/4, regardless of the mode switch settings

Some examples of rack definition are shown below.

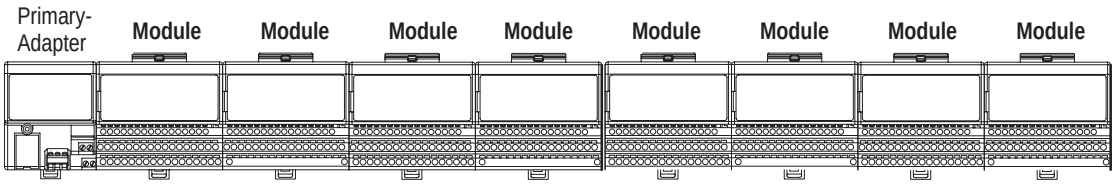
Example 1 – 8 Terminal Bases, 8 Modules



= 1 Rack in Standard mode, any density or analog module mix

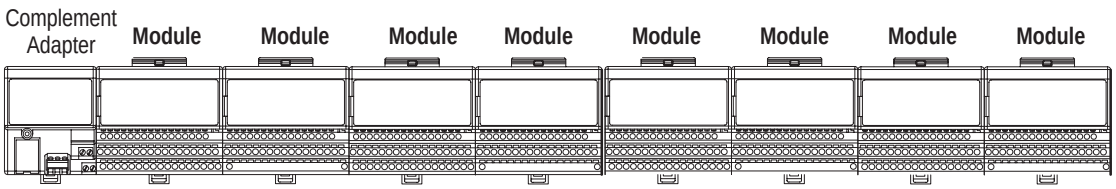
= 1/4 Rack in Compact mode with 8-pt modules; 1/2 Rack in Compact mode (with 16-pt modules)

Example 2 – 8 Terminal Bases, 8 Modules, Complementary Mode



= 1 Rack in Complementary mode (16 16-pt modules), 2 primary input modules – 2 complement output modules and vice versa; analog complemented with another analog module or an empty slot

= 1/2 Rack in Complementary mode (16 8-pt modules), 2 primary input modules – 2 complement output modules and vice versa; analog complemented with an empty slot



Last Module Position	Rack Size for each Addressing Mode				
	Standard	Compact 16	Compact 8	Complement 16	Complement 8
0	1/4 rack	1/4 rack	1/4 rack	1/4 rack	1/4 rack
1	1/4 rack	1/4 rack	1/4 rack	1/4 rack	1/4 rack
2	1/2 rack	1/4 rack	1/4 rack	1/2 rack	1/4 rack
3	1/2 rack	1/4 rack	1/4 rack	1/2 rack	1/4 rack
4	3/4 rack	1/2 rack	1/4 rack	3/4 rack	1/2 rack
5	3/4 rack	1/2 rack	1/4 rack	3/4 rack	1/2 rack
6	Full rack	1/2 rack	1/4 rack	Full rack	1/2 rack
7	Full rack	1/2 rack	1/4 rack	Full rack	1/2 rack

If a rack size offset by the selected quarter is more than a full rack, the adapter will declare a rack fault and error as indicated.

ATTENTION: Do not use the auto-config feature of 6200 software when using a PLC-3 processor with 1775-S4A or 1775-S4B scanner modules. If you do an auto-config for a scanner channel containing 1 or more 1794-ASB adapters with that configuration, the adapters may not show up in the scan list for that scanner channel. Manually insert these adapters into the scan list for the scanner.

Digital I/O Modules

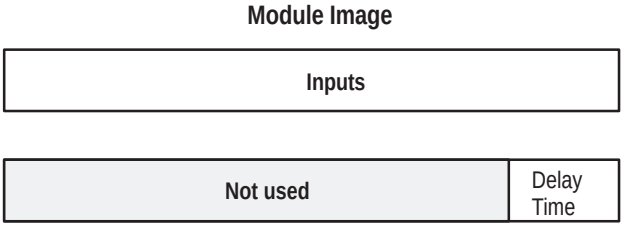
The adapter determines what type of module is installed in the terminal base unit. If the module is a digital module, the maximum amount of data the adapter will read is 1 word of input and/or 1 word of output data (dependent upon the addressing mode selected).

To see mapping for:	Refer to:
16 Sink Input Digital Module (1794-IB16)	page 3–15
16 Source Input Digital Module (1794-IV16)	page 3–16
16 Source Output Digital Module (1794-OB16)	page 3–17
16 Sink Output Digital Module (1794-OV16)	page 3–17
16 Sink Output Digital Module (1794-OV16P)	page 3–18
8 Sink Input Digital Module (1794-IB8)	page 3–19
8 Source Output Digital Module (1794-OB8)	page 3–20
8 Protected Output Digital Module (1794-OB8EP)	page 3–20
8 Input Digital Module (1794-IB8S)	page 3–21
10 Input/6 Output Digital Combo Module (1794-IB10XOB6)	page 3–22
8 Input Digital Module (1794-IA8)	page 3–23

Continued on next page.

To see mapping for:	Refer to:
8 Output Digital Module (1794-OA8)	page 3–24
8 Isolated Input Digital Module (1794-IA8I)	page 3–25
8 Isolated Output Digital Module (1794-OA8I)	page 3–26
16 Input 120V ac Module (1794-IA16)	page 3–27
16 Output 120V ac Module (1794-OA16)	page 3–28
16 Sink Input 48V dc Module (1794-IC16)	page 3–29
16 Source Output 48V dc Module (1794-OC16)	page 3–30
8 Input 220V ac Module (1794-IM8)	page 3–31
8 Output 220V ac Module (1794-OM8)	page 3–32
8 Relay Output Digital Module (1794-OW8)	page 3–32

16-point Digital Sink Input Module Image Table Mapping – 1794-IB16



Memory Map of 16-Point Digital Sink Input Module Image Table – 1794-IB16

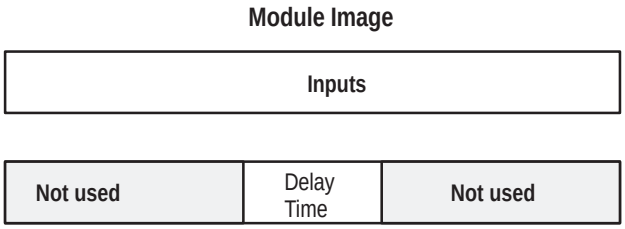
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IB16 Input Module

Bits			Description	Selected Delay Time
02	01	00	Delay Time for Inputs 00–11 (00–13)	
05	04	03	Delay Time for Inputs 12–15 (14–17)	
0	0	0	Delay Time 0 (default)	512µs
0	0	1	Delay Time 1	1ms
0	1	0	Delay Time 2	2ms
0	1	1	Delay Time 3	4ms
1	0	0	Delay Time 4	8ms
1	0	1	Delay Time 5	16ms
1	1	0	Delay Time 6	32ms
1	1	1	Delay Time 7	64ms

16-point Source Input Module Image Table Mapping – 1794-IV16



Memory Map of 16-Point Input Module Image Table – 1794-IV16

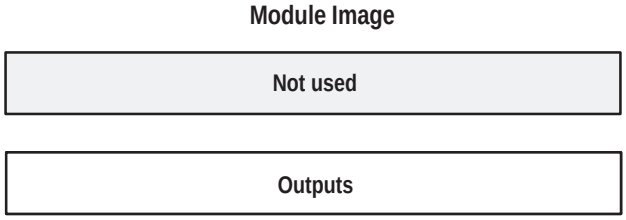
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used					FT for all channels			Not used							

Where D = Input Data
FT = Input filter Time

Input Filter Times for the 1794-IV16 Input Module

Bits			Description	Selected Delay Time
10	09	08	Delay Time for Inputs 00–15 (00–17)	
0	0	0	Filter Time 0 (default)	216µs
0	0	1	Filter Time 1	512µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

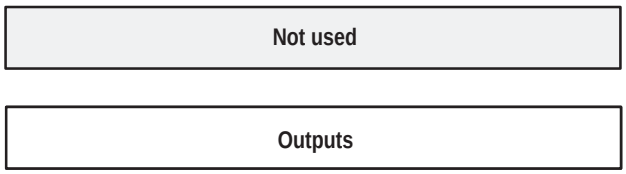
16-point Source Output Module Image Table Mapping – 1794-OB16



Memory Map of 16-Point Digital Output Module Image Table – 1794-OB16

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
Where O = Output value																

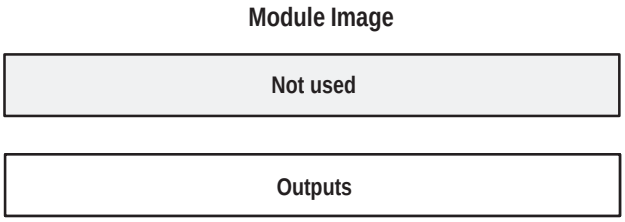
16-point Digital Sink Output Module Image Table Mapping – 1794-OV16



Memory Map of 16-Point Digital Sink Output Module Image Table – 1794-OV16

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
Where O = Output value																

16-point Digital Protected Sink Output Module Image Table Mapping – 1794-OV16P

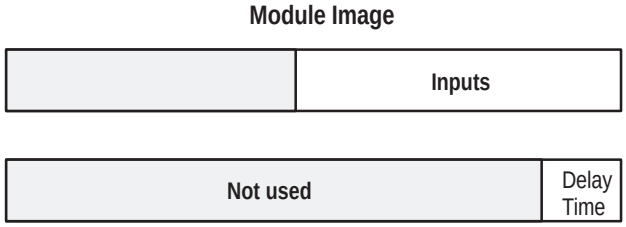


Memory Map of 16-Point Digital Protected Sink Output Module Image Table – 1794-OV16P

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Digital Sink Input Module Image Table Mapping – 1794-IB8



Memory Map of 8-Point Digital Sink Input Module Image Table – 1794-IB8

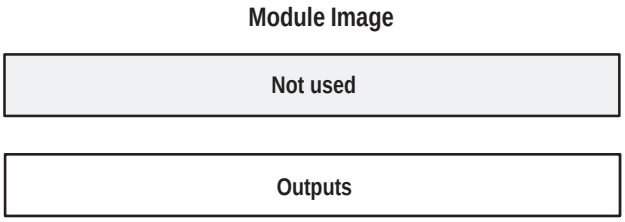
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used								D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used													DT 00–07		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IB8 Input Module

Bits			Description	Selected Delay Time
02	01	00	Delay Time for Inputs 00–07	
0	0	0	Delay Time 0 (default)	256µs
0	0	1	Delay Time 1	512µs
0	1	0	Delay Time 2	1ms
0	1	1	Delay Time 3	2ms
1	0	0	Delay Time 4	4ms
1	0	1	Delay Time 5	8ms
1	1	0	Delay Time 6	16ms
1	1	1	Delay Time 7	32ms

8-point Digital Source Output Module Image Table Mapping – 1794-OB8

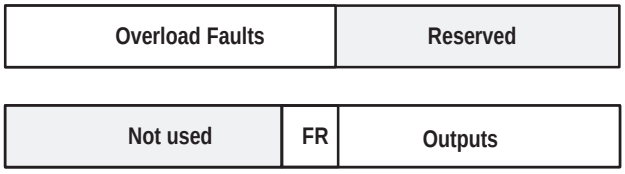


Memory Map of 8-Point Digital Output Module Image Table – 1794-OB8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Digital Electronically Fused Source Output Module Image Table Mapping – 1794-OB8EP



Memory Map of 8-Point Digital Electronically Fused Output Module Image Table – 1794-OB8EP

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	F7	F6	F5	F4	F3	F2	F1	F0	Reserved (see Note)							
Output word	Not used							FR	O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value
F = Output fault bits – 1 = fault present; 0 = no fault
FR = Fault reset bit – 1 = reset output; 0 = no change

Note: The unused lower byte in the input word floats during operation. Do not use this byte for fault status. Your program must mask this lower byte.

8-point Digital Input Module Image Table Mapping – 1794-IB8S

Module Image

Status	Inputs

Not used	Delay Time

Memory Map of 8-Point Digital Input Module Image Table (with Status) – 1794-IB8S

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D7	D6	D5	D4	D3	D2	D1	D0	S7	S6	S5	S4	S3	S2	S1	S0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

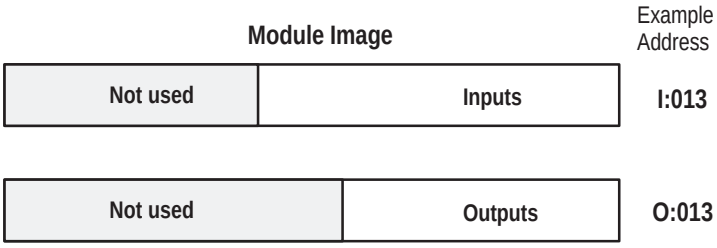
Where S = Status of input
D = Input Data
DT = Input Delay Time

Smart Sensor (such as Allen-Bradley Series 9000 Heartbeat Sensors)			
Bits 08–15 (10–17)	D = Diagnostic data – 1 = Fault present (Smart) 0 = Normal (no errors)	Bits 00–07 (00–07)	S = Input data 1 = Sensor on 0 = Sensor off
Standard Sensor			
Bits 08–15 (10–17)	D = Diagnostic data – 1 = Diagnostics not disabled 0 = Normal (Disabled)	Bits 00–07 (00–07)	S = Input data 1 = Sensor on 0 = Sensor off

Input Delay Times for the 1794-IB8S Input Module

Bits			Description	Selected Delay Time
02	01	00	Delay Time for Inputs 00–11 (00–13)	
05	04	03	Delay Time for Inputs 12–15 (14–17)	
0	0	0	Delay Time 0 (default)	512µs
0	0	1	Delay Time 1	1ms
0	1	0	Delay Time 2	2ms
0	1	1	Delay Time 3	4ms
1	0	0	Delay Time 4	8ms
1	0	1	Delay Time 5	16ms
1	1	0	Delay Time 6	32ms
1	1	1	Delay Time 7	64ms

16-point Digital Input/Output Module Image Table Mapping – 1794-IB10XOB6

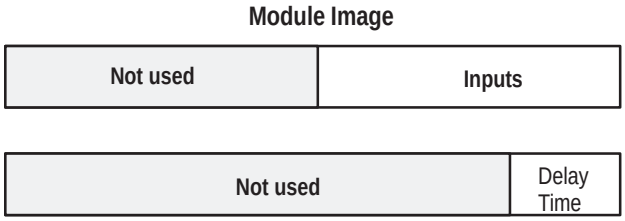


Memory Map of 16-Point Digital Input/Output Module Image Table – 1794-IB10XOB6

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input Word	Not used						I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Output Word	Not used										O5	O4	O3	O2	O1	O0

Where I = Input Channel
O = Output Channel

8-point Digital Input Module Image Table Mapping – 1794-IA8



Memory Map of 8-point Digital Input Module Image Table – 1794-IA8

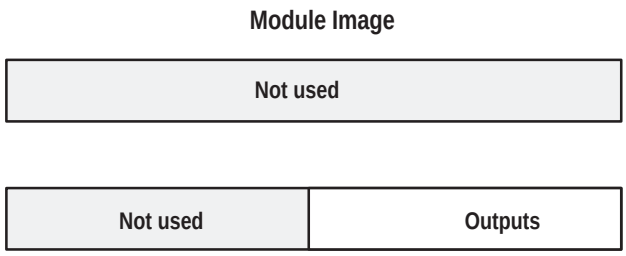
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used								D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IA8 Input Module

Bits			Description	Maximum Delay Time	
02	01	00	Delay Time for Inputs 00–07	Off to On	On to Off
0	0	0	Delay Time 0 (default)	8.6ms	26.6ms
0	0	1	Delay Time 1	9ms	27ms
0	1	0	Delay Time 2	10ms	28ms
0	1	1	Delay Time 3	12ms	30ms
1	0	0	Delay Time 4	17ms	35ms
1	0	1	Delay Time 5	26ms	44ms
1	1	0	Delay Time 6	43ms	61ms
1	1	1	Delay Time 7	78ms	96ms

8-point Digital Output Module Image Table Mapping – 1794-OA8

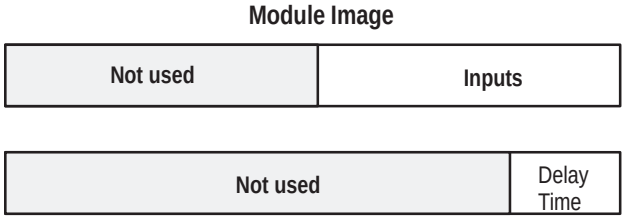


Memory Map of 8-Point Digital Output Module Image Table – 1794-OA8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Digital Isolated Input Module Image Table Mapping – 1794-IA8I



Memory Map of 8-point Digital Isolated Input Module Image Table – 1794-IA8I

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used								D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used													DT 00–07		

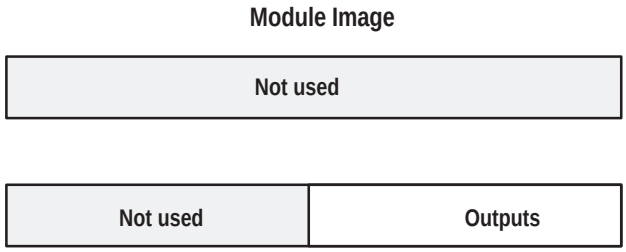
Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IA8I Input Module

Bits			Description	Selected Delay	Maximum Delay Time	
02	01	00	Delay Time for Inputs 00–07		Off to On[1]	On to Of[2]
0	0	0	Delay Time 0 (default)	512µs	8.6ms	26.6ms
0	0	1	Delay Time 1	1ms	9ms	27ms
0	1	0	Delay Time 2	2ms	10ms	28ms
0	1	1	Delay Time 3	4ms	12ms	30ms
1	0	0	Delay Time 4	8ms	16ms	34ms
1	0	1	Delay Time 5	16ms	24ms	42ms
1	1	0	Delay Time 6	32ms	40ms	58ms
1	1	1	Delay Time 7	64ms	72ms	90ms

1 Off to on delay is 8ms plus additional delay as specified. Refer to specifications.
2 On to off delay is 26ms plus additional delay as specified. Refer to specifications.

8-point Digital Isolated Output Module Image Table Mapping – 1794-OA8I



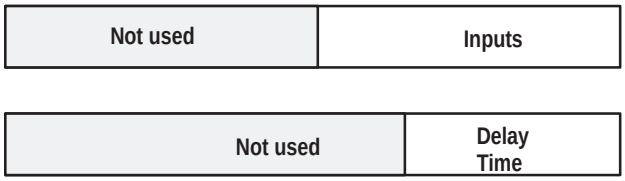
Memory Map of 8-Point Digital Isolated Output Module Image Table – 1794-OA8I

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

16-point Digital Input Module Image Table Mapping – 1794-IA16

Module Image



Memory Map of 16-point Digital Input Module Image Table – 1794-IA16

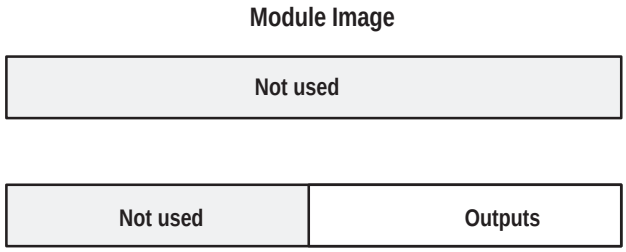
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IA16 Input Module

Bits			Description	Maximum Delay Time	
02	01	00	Delay Time for Inputs 00–11 (00–13)	Off to On	On to Off
05	04	03	Delay Time for Inputs 12–15 (14–17)		
0	0	0	Delay Time 0 (default)	7.5ms	26.6ms
0	0	1	Delay Time 1	8ms	27ms
0	1	0	Delay Time 2	9ms	28ms
0	1	1	Delay Time 3	10ms	29ms
1	0	0	Delay Time 4	12ms	31ms
1	0	1	Delay Time 5	16ms	35ms
1	1	0	Delay Time 6	24.5ms	44ms
1	1	1	Delay Time 7	42ms	60.5ms

16-point Digital Output Module Image Table Mapping – 1794-OA16

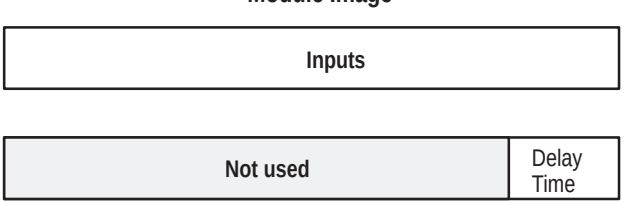


Memory Map of 16-Point Digital Output Module Image Table – 1794-OA16

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

16-point Digital Sink Input Module Image Table Mapping – 1794-IC16



Memory Map of 16-Point Digital Sink Input Module Image Table – 1794-IC16

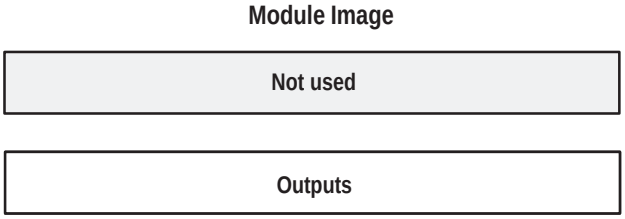
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Output word	Not used										FT 12–15 (14–17)			FT 00–11 (00–13)		

Where I = Input Data
FT = Input Filter Time

Input Delay Times for the 1794-IC16 Input Module

Bits			Description	Selected Delay Time
02	01	00	Filter Time for Inputs 00–11 (00–13)	
05	04	03	Filter Time for Inputs 12–15 (14–17)	
0	0	0	Filter Time 0 (default)	250µs
0	0	1	Filter Time 1	500µs
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

16-point Digital Source Output Module Image Table Mapping – 1794-OC16



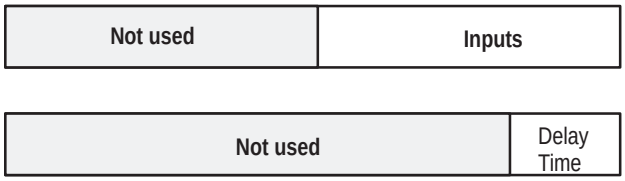
Memory Map of 16-Point Digital Output Module Image Table – 1794-OC16

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Digital Input Module Image Table Mapping – 1794-IM8

Module Image



Memory Map of 8-point Digital Input Module Image Table – 1794-IM8

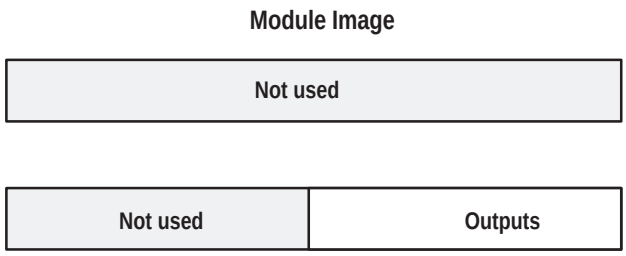
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used								I7	I6	I5	I4	I3	I2	I1	I0
Output word	Not used													DT 00–07		

Where I = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IM8 Input Module

Bits			Description	Maximum Delay Time	
02	01	00	Delay Time for Inputs 00–07	Off to On	On to Of[f]
0	0	0	Delay Time 0 (default)	7.5ms	26.5ms
0	0	1	Delay Time 1	8ms	27ms
0	1	0	Delay Time 2	9ms	28ms
0	1	1	Delay Time 3	10ms	29ms
1	0	0	Delay Time 4	12ms	31ms
1	0	1	Delay Time 5	16ms	35ms
1	1	0	Delay Time 6	24.5ms	44ms
1	1	1	Delay Time 7	42ms	60.5ms

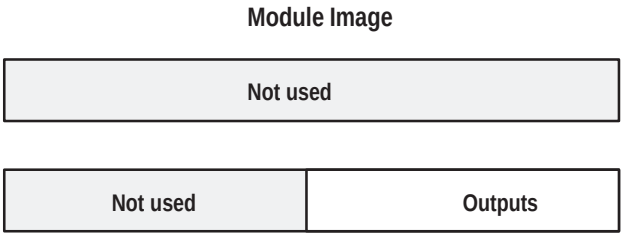
8-point Digital Output Module Image Table Mapping – 1794-OM8



Memory Map of 8-Point Digital Output Module Image Table – 1794-OM8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0
Where O = Output value																

8-point Digital Relay Output Module Image Table Mapping – 1794-OW8



Memory Map of 8-Point Digital Output Module Image Table – 1794-OW8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0
Where O = Output value: when bit = 0, output is off; when bit = 1, output is on.																

Analog I/O Modules

At powerup, the adapter identifies the type of module installed in the base unit. If the module is an analog module, the adapter will access 15 words of data.

ATTENTION: If using Series A 1794-IE8, -OE4 or -IE4XOE2 modules, do not use configure select and full range bit settings of 0. Individual channels revert to 4–20mA with bit selections of all zeroes. This could result in unwanted or incorrect action.

ATTENTION: The series A adapters and the series B or later adapters process block transfers differently. Series A adapters allow block transfers to continue to occur even when an analog module is removed from its base. With series B or later adapters, when a module is removed from its terminal base, the series B or later adapter ceases to do block transfers to the processor. This provides feedback to the processor that a block transfer module has been removed.
The “hold inputs” feature, selectable on the switch assembly on the adapter, does not apply to analog modules. If you need this feature, you must simulate it in your programming.

ATTENTION: If the adapter is powered up before analog modules, the adapter will not recognize the analog module. Make certain that analog modules are installed and powered up before or simultaneously with the remote I/O adapter. If the adapter does not establish communication with the analog module, cycle power to the adapter.

To see mapping for:	Refer to:
8 input analog module (1794-IE8/B)	page 3–34
4 output analog module (1794-OE4/B)	page 3–35
4 input/2 output analog combo module (1794-IE4XOE2/B)	page 3–37
8 RTD input module (1794-IR8)	page 3–39
8 Thermocouple/mV input module (1794-IT8)	page 3–40
8 RTD/Thermocouple/mV input module (1794-IRT8)	page 3–40
4 isolated input module (1794-IF4I)	page 3–43
4 isolated output module (1794-OF4I)	page 3–46
2 isolated input/2 isolated output module (1794-IF2XOF2I)	page 3–48
Frequency Input Module (1794-IJ2)	page 3–51
2 Input Incremental Encoder Module (1794-ID2)	page 3–53
4 Input Pulse Counter Module (1794-IP4)	page 3–54

8 Input Analog Module (Cat. No. 1794-IE8 Series B)

Module Image

Input Data Channel 0		
Input Data Channel 1		
Input Data Channel 2		
Input Data Channel 3		
Input Data Channel 4		
Input Data Channel 5		
Input Data Channel 6		
Input Data Channel 7		
PU		Underrange

Configure select

Analog Input Module (1794-IE8/B) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word 0	S	Analog Value Channel 0														
Word 1	S	Analog Value Channel 1														
Word 2	S	Analog Value Channel 2														
Word 3	S	Analog Value Channel 3														
Word 4	S	Analog Value Channel 4														
Word 5	S	Analog Value Channel 5														
Word 6	S	Analog Value Channel 6														
Word 7	S	Analog Value Channel 7														
Word 8	PU	Not used – set to zero							U7	U6	U5	U4	U3	U2	U1	U0

Where: S = sign bit (in 2's complement)
U = Underrange bits for 4-20mA inputs
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Input Module (1794-IE8/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word 0	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0

Where: C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-IE8/B Analog Input Module

Channel No.	Channel 0		Channel 1		Channel 2		Channel 3		Channel 4		Channel 5		Channel 6		Channel 7	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5	F6	C6	F7	C7
Decimal Bits (Octal Bits)	00	08 (10)	01	09 (11)	02	10 (12)	03	11 (13)	04	12 (14)	05	13 (15)	06	14 (16)	07	15 (17)
0–10V dc/0–20mA	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
4–20mA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

1 When configured to off, individual channels will return 0000H on Series B modules, and 4 to 20mA on Series A modules.

4 Output Analog Module (Cat. No. 1794-OE4 Series B)

Module Image

PU	Not used	Diagnostics

Analog Data Channel 0
Analog Data Channel 1
Analog Data Channel 2
Analog Data Channel 3

Not used	MC

Not used	Config. Select	Not used	Full Range

Not used
Not used
Not used
Not used
Safe State Value – Channel 0
Safe State Value – Channel 1
Safe State Value – Channel 2
Safe State Value – Channel 3

Analog Output Module (1794-OE4) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	PU	Not used – set to 0											W3	W2	W1	W0

Where: W = Diagnostic bits for current output – wire broken or load resistance high. (4-20mA mode only. Not used on voltage outputs.)
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Output Module (1794-OE4/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	S	Analog Data – Channel 0														
Word 1	S	Analog Data – Channel 1														
Word 2	S	Analog Data – Channel 2														
Word 3	S	Analog Data – Channel 3														
Word 4	0	Not used – set to 0											M3	M2	M1	M0
Word 5	0	Not used – set to 0			C3	C2	C1	C0	Not used – set to 0				F3	F2	F1	F0
Word 6 thru 9	Not used – set to 0															
Word 10	S	Safe State Value – Channel 0														
Word 11	S	Safe State Value – Channel 1														
Word 12	S	Safe State Value – Channel 2														
Word 13	S	Safe State Value – Channel 3														

Where: S = Sign bit (in 2's complement)
M = Multiplex control
C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-OE4/B Analog Output Module (Word 5)

Channel No.	Channel 0		Channel 1		Channel 2		Channel 3	
	F0	**C0**	**F1**	**C1**	**F2**	**C2**	**F3**	**C3**
Decimal Bits (Octal Bits)	**00**	**08 (10)**	**01**	**09 (11)**	**02**	**10 (12)**	**03**	**11 (13)**
4–20mA	0	1	0	1	0	1	0	1
0–10V dc/0–20mA	1	0	1	0	1	0	1	0
-10 to +10V dc	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

[1] When configured to off, individual channels will send 0V or 0mA on Series B modules. On Series A modules, 2V or 4mA is output until the module is configured.

4 Input/2 Output Analog Combo Module (Cat. No. 1794-IE4XOE2 Series B)

Module Image

Input Data Channel 0		
Input Data Channel 1		
Input Data Channel 2		
Input Data Channel 3		
PU		Underrange & Diag.

Output Data Channel 0		
Output Data Channel 1		
Not used		M
Not used	Full Range and Configure Select	
Not used		
Not used		
Safe State Value – Output Channel 0		
Safe State Value – Output Channel 1		

Analog Combo Module (1794-IE4XOE2/B) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Read Word 0	S	Analog Value Input Channel 0														
Word 1	S	Analog Value Input Channel 1														
Word 2	S	Analog Value Input Channel 2														
Word 3	S	Analog Value Input Channel 3														
Word 4	PU	Not used – set to 0									W1	W0	U3	U2	U1	U0

Where: S = sign bit (in 2's complement)
W = Diagnostic bits for current output wire broken or load resistance high. (Not used on voltage outputs.)
U = Underrange bits for 4-20mA inputs
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Combo Module (1794-IE4XOE2/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	S	Analog Data – Output Channel 0														
Word 1	S	Analog Data – Output Channel 1														
Word 2	0	Not used – set to 0													M1	M0
Word 3	Not used		C5	C4	C3	C2	C1	C0	0	0	F5	F4	F3	F2	F1	F0
Words 4 and 5	Not used – set to 0															
Word 6	S	Safe State Value – Output Channel 0														

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word 7	S	Safe State Value – Output Channel 1														

Where: S = Sign bit (in 2's complement)
M = Multiplex control
C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-IE4XOE2/B Analog Combo Module

Channel No.	Input Channel 0		Input Channel 1		Input Channel 2		Input Channel 3		Output Channel 0		Output Channel 1	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5
Decimal Bits (Octal Bits)	00	08 (10)	01	09 (11)	02	10 (12)	03	11 (13)	04	12 (14)	05	13 (15)
4–20mA	0	1	0	1	0	1	0	1	0	1	0	1
0–10V dc/0–20mA	1	0	1	0	1	0	1	0	1	0	1	0
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit
F = Full range bit
1 When configured to off, individual channels will send 0V or 0mA on Series B modules. On Series A modules, 2V or 4mA is output until the module is configured.

RTD Input Module (1794-IR8) Image Table Mapping

Module Image

Reserved	
Input Data Channel 0	
Input Data Channel 1	
Input Data Channel 2	
Input Data Channel 3	
Input Data Channel 4	
Input Data Channel 5	
Input Data Channel 6	
Input Data Channel 7	
Overrange	Underrange
Calibration Status	

Calibration Mask	Configuration
RTD Type	
RTD Type	

RTD Analog Input Module (1794-IR8) Read

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	Reserved															
1	Channel 0 Input Data															
2	Channel 1 Input Data															
3	Channel 2 Input Data															
4	Channel 3 Input Data															
5	Channel 4 Input Data															
6	Channel 5 Input Data															
7	Channel 6 Input Data															
8	Channel 7 Input Data															
9	Overrange Bits								Underrange Bits							
10	0	0	0	0	0	Bad Cal	Cal Done	Cal Range	0	Diagnostic Status Bits			Pwr Up	Reserved	0	0

RTD Analog Input Module (1794-IR8) Write

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Write Word 0	8-bit Calibration Mask								Cal Clk	Cal Hi Cal Lo	Filter Cutoff			Enh	MDT	
1	RTD 3 Type				RTD 2 Type				RTD 1 Type				RTD 0 Type			
2	RTD 7 Type				RTD 6 Type				RTD 5 Type				RTD 4 Type			

Where: Enh = Enhanced
MDT = Module Data Type

Thermocouple/mV Input Module (1794-IT8) Image Table Mapping

Module Image

Reserved	
Input Data Channel 0	
Input Data Channel 1	
Input Data Channel 2	
Input Data Channel 3	
Input Data Channel 4	
Input Data Channel 5	
Input Data Channel 6	
Input Data Channel 7	
Overrange	Underrange
Calibration Status	

Calibration Mask	Configuration
Thermocouple Type	
Thermocouple Type	

Thermocouple/mV Input Module (1794-IT8) Read

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	Reserved															
1	Channel 0 Input Data															
2	Channel 1 Input Data															
3	Channel 2 Input Data															
4	Channel 3 Input Data															
5	Channel 4 Input Data															
6	Channel 5 Input Data															
7	Channel 6 Input Data															
8	Channel 7 Input Data															

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
9	Overrange Bits								Underrange Bits							
10	0	0	0	0	0	Bad Cal	Cal Done	Cal Range	0	Diagnostic Status			Pwr Up	Bad Structure	CJC over	CJC Under

Thermocouple/mV Input Module (1794-IT8) Write

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Write Word 0	8-Bit Calibration Mask								Cal Clk	Cal hi Cal lo	Filter Cutoff			FDF	Data Type	
1	Thermocouple 3 Type				Thermocouple 2 Type				Thermocouple 1 Type				Thermocouple 0 Type			
2	Thermocouple 7 Type				Thermocouple 6 Type				Thermocouple 5 Type				Thermocouple 4 Type			

Where: FDF = fixed digital filter bit

Thermocouple/RTD Input Module (1794-IRT8) Image Table Mapping

Module Image

Input Data Channel 0
Input Data Channel 1
Input Data Channel 2
Input Data Channel 3
Input Data Channel 4
Input Data Channel 5
Input Data Channel 6
Input Data Channel 7
Overrange / Underrange
Alarms / CJC / Diagnostics
RFlg / EDT command and response
Data Format / FM / Reference Jct / Filter Cut
TC/RTD / Mode / Sensor Type / TC/RTD / Mode / Sensor Type
RTD Offsets for each channel
CFlg / EDT command and data

Thermocouple/RTD/mV Input Module (1794-IRT8) Read

Decimal	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word⇓	Read															
0	Channel 0 Input Data															
1	Channel 1 Input Data															
2	Channel 2 Input Data															

Decimal	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
3	Channel 3 Input Data															
4	Channel 4 Input Data															
5	Channel 5 Input Data															
6	Channel 6 Input Data															
7	Channel 7 Input Data															
8	Overrange Alarm Bits (channel 0 = bit 08, etc)								Underrange Alarm Bits (channel 0 = bit 00, etc)							
9	Flt Alm Ch7	Flt Alm Ch6	Flt Alm Ch5	Flt Alm Ch4	Flt Alm Ch3	Flt Alm Ch2	Flt Alm Ch1	Flt Alm Ch0	Rsvd	CJC 2 Alm	CJC 1 Alm	Rsvd	Diagnostic Status			
10	Resp Flg	EDT command response							EDT response data							

Thermocouple/RTD/mV Input Module (1794-IRT8) Write

Decimal	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Word⇓	Write															
0	Not used				Data Format				Flt Mode Ch 0-3	Flt Mode Ch 4-7	Reference Jct.			Filter Cutoff		
1	TC/RTD Ch. 4-7		Sensor Mode Ch. 4-7		Sensor Mode Ch. 4-7				TC/RTD Ch. 0-3		Sensor Mode Ch. 0-3		Sensor Mode Ch. 0-3			
2	RTD Offset Ch 7		RTD Offset Ch 6		RTD Offset Ch 5		RTD Offset Ch 4		RTD Offset Ch 3		RTD Offset Ch 2		RTD Offset Ch 1		RTD Offset Ch 0	
3	Cmd Flag	EDT command							EDT command data							

Isolated Analog Input Module (1794-IF4I) Image Table Mapping

Module Image

Input Data Channel 0															
Input Data Channel 1															
Input Data Channel 2															
Input Data Channel 3															
Real Time Sample															
PU	FP	CF	0										BD	DN	0
								V3	V2	V1	V0	U3	U2	U1	U0

EN															
Channel Filters															
Channel Configuration															
	Real Time Interval														
IC	1	TR	IT									RV	QK	CK	GO	Channel #

Isolated Input Module (1794-IF4I) Read

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Read Word 0	Analog Value Channel 0															
Word 1	Analog Value Channel 1															
Word 2	Analog Value Channel 2															
Word 3	Analog Value Channel 3															
Word 4	0	Real Time Sample														
Word 5	PU	FP	CF	0	Reserved				0	0	0	0	0	BD	DN	0
Word 6	0	0	0	0	0	0	0	0	V3	V2	V1	V0	U3	U2	U1	U0

Where: PU = Power up unconfigured state
FP = Field power off
CF = In configuration mode
BD = Calibration bad
DN = Calibration accepted
U = Under range for specified channel
V = Overrange for specified channel

Isolated Input Module (1794-IF4I) Write

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	EN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Word 1	Chnl 3 Filter				Chnl 2 Filter				Chnl 1 Filter				Chnl 0 Filter			
Word 2	Chnl 3 Configuration				Chnl 2 Configuration				Chnl 1 Configuration				Chnl 0 Configuration			
Word 3	0	Real Time Sample Interval														
Word 4	IC	1	TR	IT	0	0	0	0	RV	QK	CK	GO	Channel Number			

Where: EN = Not used on the 1794-IF4I
IC = Initiate configuration bit
TR = Transparent bit
IT = Interrupt toggle bit
RV = Revert to defaults bit
QK = Quick calibration
CK = Calibration clock
GO = Gain offset select

Input Channel Configurations for the 1794-IF4I Module

Input Channel Configuration				
03	02	01	00	Set these bits for Channel 0
07	06	05	04	Set these bits for Channel 1
11	10	09	08	Set these bits for Channel 2
15	14	13	12	Set these bits for Channel 3

Bit Settings				Input Values	Data Format	% Underrange/ % Overrange	Input Range Hexadecimal	Input Range Decimal	Channel Update Rate (RTS = 0)
0	0	0	0	Channel not configured					
0	0	0	1	4–20mA	signed 2's complement	4% Under; 4% Over	<0000–7878>	<0000–30840>	7.5ms
0	0	1	0	±10V	signed 2's complement	2% Under, 2% Over	<831F–7CE1>	<–31208–31208>	2.5ms
0	0	1	1	±5V	signed 2's complement	4% Under, 4% Over	<8618–79E8>	<–31208–31208>	2.5ms
0	1	0	0	0–20mA	signed 2's complement %	0% Under, 4% Over	0–10000>	0–10000>	7.5ms
0	1	0	1	4-20mA	signed 2's complement %	4% Under, 4% Over	<0–10000>	<0–10000>	7.5ms
0	1	1	0	0–10V	signed 2's complement %	0% Under, 2% Over	0–10000>	0–10000>	5.0ms
0	1	1	1	±10V	signed 2's complement %	2% Under, 2% Over	<–10000–10000>	<–10000–10000>	5.0ms
1	0	0	0	0–20mA	binary	0% Under, 4% Over	0000–F3CF>	0000–62415>	2.5ms
1	0	0	1	4–20mA[1]	binary	4% Under, 4% Over	0000–F0F1>	0000–61681>	7.5ms
1	0	1	0	0–10V	binary	0% Under, 2% Over	0000–F9C2>	0000–62415>	2.5ms
1	0	1	1	0–5V	binary	0% Under, 4% Over	0000–F3CF>	0000–62415>	2.5ms
1	1	0	0	±20mA	offset binary, 8000H = 0mA	4% Under, 4% Over	<0618–F9E8>	32768–63976>	2.5ms
1	1	0	1	4–20mA	offset binary, 8000H = 4mA	4% Under, 4% Over	<8000–F878>	<32768–63608>	7.5ms
1	1	1	0	±10V	offset binary, 8000H = 0V	2% Under, 2% Over	<031F–FCE1>	<799–64737>	2.5ms
1	1	1	1	±5V	offset binary, 8000H = 0V	4% Under, 4% Over	<0618–F9E8>	<1560–63976>	2.5ms

[1] Underrange for 4-20mA occurs in the blind area below 0 (3.2mA).

Input Filter Settings for the 1794-IF4I Module

Input Channel Filter					
Bits				Channel	
03	02	01	00	Input 0	
07	06	05	04	Input 1	
11	10	09	08	Input 2	
15	14	13	12	Input 3	
				A/D Conversion Rate	Low Pass Filter
0	0	0	0	1200Hz	No low pass
0	0	0	1	1200Hz	100ms low pass
0	0	1	0	1200Hz	500ms low pass
0	0	1	1	1200Hz	1000ms low pass
0	1	0	0	600Hz	No low pass
0	1	0	1	600Hz	100ms low pass
0	1	1	0	600Hz	500ms low pass
0	1	1	1	600Hz	1000ms low pass
1	0	0	0	300Hz	No low pass
1	0	0	1	300Hz	100ms low pass
1	0	1	0	300Hz	500ms low pass
1	0	1	1	300Hz	1000ms low pass
1	1	0	0	150Hz	No low pass
1	1	0	1	150Hz	100ms low pass
1	1	1	0	150Hz	500ms low pass
1	1	1	1	150Hz	1000ms low pass

Isolated Analog Output Module (1794-OF4I) Image Table Mapping

Module Image

Read Back Channel 0															
Read Back Channel 1															
Read Back Channel 2															
Read Back Channel 3															
PU	FP	CF	0										BD	DN	0
				P3	P2	P1	P0					W3	W2	W1	W0

EN	S1	S0													
Output Data Channel 0															
Output Data Channel 1															
Output Data Channel 2															
Output Data Channel 3															
Channel Configuration															
IC	1	TR	IT	Q3	Q2	Q1	Q0	RV	QK	CK	GO	Channel #			

Isolated Output Module (1794-OF4I) Read

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Read Word 0	Read Back Channel 0															
Word 1	Read Back Channel 1															
Word 2	Read Back Channel 2															
Word 3	Read Back Channel 3															
Word 4	PU	FP	CF	0	Reserved				0	0	0	0	0	BD	DN	0
Word 5	0	0	0	0	P3	P2	P1	P0	0	0	0	0	W3	W2	W1	W0

Where: PU = Power up unconfigured state
FP = Field power off
CF = In configuration mode
BD = Calibration bad
U = Under range for specified channel
V = Overrange for specified channel
P0 thru P3 = Outjput holding in response to Q0 thru Q3
W0 thru W3 = Wire off current loop status for channels 0 thru 3 respectively

Isolated Output Module (1794-OF4I) Write

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	EN	S1	S0	0	0	0	0	0	0	0	0	0	0	0	0	0
Word 1	Output Data Channel 0															
Word 2	Output Data Channel 1															
Word 3	Output Data Channel 2															
Word 4	Output Data Channel 3															
Word 5	Chnl 3 Configuration				Chnl 2 Configuration				Chnl 1 Configuration				Chnl 0 Configuration			
Word 6	IC	1	TR	IT	Q3	Q2	Q1	Q0	RV	QK	CK	GO	Channel Number			

Where: EN = Enable outputs; 0 = output follows S1/S0, 1 = output enabled
S1/S0 = Safe State Source
IC = Initiate configuration bit
TR = Transparent bit
IT = Interrupt toggle bit
Q0 thru Q3 = Requests for outputs to hold
RV = Revert to defaults bit
QK = Quick calibration
CK = Calibration clock
GO = Gain offset select

Output Range Selection and Update Rate

Configuration Bits MSD			LSD	Nominal Range	Data Type	Output Values Hexadecimal	Decimal	Update Rate
0	0	0	1	4-20mA	2’ complement	<0000–7878>	<0000–30840>	5.0ms
0	0	1	0	±10V	2’ complement	<831F–79E8>	<–31208–31208>	2.5ms
0	0	1	1	±5V	2’ complement	<8618–79E8>	<–31208–31208>	2.5ms
0	1	0	0	0-20mA	2’ complement %	0–10000>	0–10000>	5.0ms
0	1	0	1	4-20mA	2’ complement %	<0–10000>	<0–10000>	5.0ms
0	1	1	0	0-10V	2’ complement %	0–10000>	0–10000>	5.0ms
0	1	1	1	±10V	2’ complement	<–10000–10000>	<–10000–10000>	5.0ms
1	0	0	0	0-20mA	binary	0000–F3CF>	0000–62415>	2.5ms
1	0	0	1	4-20mA	binary	0000–F0F1>	0000–61681>	5.0ms
1	0	1	0	0-–10V	binary	0000–F3CF>	0000–62415>	2.5ms
1	0	1	1	0-5V	binary	0000–F3CF>	0000–62415>	2.5ms
1	1	0	0	±20mA	offset binary	<8000–F9E8>	32768–63976>	2.5ms
1	1	0	1	4-20mA	offset binary	<8000–F878>	<32768–63608>	5.0ms
1	1	1	0	±10V	offset binary	<0618–F9E8>	<1560–63976>	2.5ms
1	1	1	1	±5V	offset binary	<0618–F9E8>	<1560–63976>	2.5ms

Isolated Analog Input/Output Module (1794-IF2XOF2I) Image Table Mapping

Module Image

Input Data Channel 0															
Input Data Channel 1															
Read Back Channel 0															
Read Back Channel 1															
Real Time Sample															
PU	FP	CF	0										BD	DN	0
				P1	P0			V1	V0	W1	W0	U1	U0		

EN	S1	S0													
Output Data Channel 0															
Output Data Channel 1															
Channel Configuration															
														Input Channel Filters	
Real Time Interval															
IC	1	TR	IT	Q1	Q0		RV	QK	CK	GO	Channel #				

Isolated Input/Output Module (1794-IF2XOF2I) Read

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Read Word 0	Analog Value Input Channel 0															
Word 1	Analog Value Input Channel 1															
Word 2	Read Back Output Channel 0															
Word 3	Read Back Output Channel 1															
Word 4	Real Time Sample															
Word 5	PU	FP	CF	0	Reserved				0	0	0	0	0	BD	DN	0
Word 6	0	0	0	0	P1	P0	0	0	0	0	V1	V0	W1	W0	U1	U0

Where:
PU = Power up unconfigured state
FP = Field power off
CF = In configuration mode
BD = Calibration bad
DN = Calibration accepted
U = Under range for specified channel
W = Wire off on current output
V = Overrange for specified channel
P = Hold output based on Q0 and Q1

Isolated Input/Output Module (1794-IF2XOF2I) Write

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	EN	S1	S0	0	0	0	0	0	0	0	0	0	0	0	0	0
Word 1	Output Data Channel 0															
Word 2	Output Data Channel 1															
Write 3	0	0	0	0	0	0	0	0	Input Channel 1 Filter				Input Channel 0 Filter			
Word 4	Output Chnl 1 Configuration				Output Chnl 0 Configuration				Input Chnl 1 Configuration				Input Chnl 0 Configuration			
Word 5	0	Real Time Sample Programmed Interval														
Word 6	IC	1	TR	IT	Q1	Q0	0	0	RV	QK	CK	GO	Channel Number			

Where: EN = Enable outputs – 0 = output follows S1/S0; 1 = output enabled
S0 and S1 = Safe state source bits
IC = Initiate configuration bit
TR = Transparent bit
IT = Interrupt toggle bit
Q0 and Q1 = Requests for channel outputs to hold
RV = Revert to defaults bit
QK = Quick calibration
CK = Calibration clock
GO = Gain offset select

Input Channel Configurations (word 3) for the 1794-IF2XOF2I Module

Input Channel Configuration

03	02	01	00	Set these bits for Channel 0
07	06	05	04	Set these bits for Channel 1

Bit Settings				Input Values	Data Format	% Underrange/ % Overrange	Input Range Hexadecimal	Input Range Decimal	Module Update Rate (RTS = 0)
0	0	0	0	Channel not configured					
0	0	0	1	4–20mA	signed 2's complement	4% Under; 4% Over	<0000–7878>	<0000–30840>	7.5ms
0	0	1	0	±10V	signed 2's complement	2% Under, 2% Over	<831F–7CE1>	<–31208–31208>	2.5ms
0	0	1	1	±5V	signed 2's complement	4% Under, 4% Over	<8618–79E8>	<–31208–31208>	2.5ms
0	1	0	0	0–20mA	signed 2's complement %	0% Under, 4% Over	0–10000>	0–10000>	7.5ms
0	1	0	1	4-20mA	signed 2's complement %	4% Under, 4% Over	<0–10000>	<0–10000>	7.5ms
0	1	1	0	0–10V	signed 2's complement %	0% Under, 2% Over	0–10000	0–10000>	5.0ms
0	1	1	1	±10V	signed 2's complement %	2% Under, 2% Over	<–10000–10000>	<–10000–10000>	5.0ms
1	0	0	0	0–20mA	binary	0% Under, 4% Over	0000–F3CF>	0000–62415>	2.5ms
1	0	0	1	4–20mA[1]	binary	4% Under, 4% Over	0000–F0F1>	0000–61681>	7.5ms
1	0	1	0	0–10V	binary	0% Under, 2% Over	0000–F9C2>	0000–62415>	2.5ms
1	0	1	1	0–5V	binary	0% Under, 4% Over	0000–F3CF>	0000–62415>	2.5ms
1	1	0	0	±20mA	offset binary, 8000H = 0mA	4% Under, 4% Over	<0618–F9E8>	32768–63976>	2.5ms
1	1	0	1	4–20mA	offset binary, 8000H = 4mA	4% Under, 4% Over	<8000–F878>	<32768–63608>	7.5ms
1	1	1	0	±10V	offset binary, 8000H = 0V	2% Under, 2% Over	<031F–FCE1>	<1560–63976>	2.5ms
1	1	1	1	±5V	offset binary, 8000H = 0V	4% Under, 4% Over	<0618–F9E8>	<1560–63976>	2.5ms

[1] Underrange for 4-20mA occurs in the blind area below 0 (3.2mA).

Input Filter Settings for the 1794-IF2XOF2I Module

Input Channel Filter					
Bits				Channel	
03	02	01	00	Input 0	
07	06	05	04	Input 1	
				Conversion Rate	Low Pass Filter
0	0	0	0	1200Hz	No low pass
0	0	0	1	1200Hz	100ms low pass
0	0	1	0	1200Hz	500ms low pass
0	0	1	1	1200Hz	1000ms low pass
0	1	0	0	600Hz	No low pass
0	1	0	1	600Hz	100ms low pass
0	1	1	0	600Hz	500ms low pass
0	1	1	1	600Hz	1000ms low pass
1	0	0	0	300Hz	No low pass
1	0	0	1	300Hz	100ms low pass
1	0	1	0	300Hz	500ms low pass
1	0	1	1	300Hz	1000ms low pass
1	1	0	0	150Hz	No low pass
1	1	0	1	150Hz	100ms low pass
1	1	1	0	150Hz	500ms low pass
1	1	1	1	150Hz	1000ms low pass

Output Range Selection and Update Rate

Configuration Bits MSD			LSD	Nominal Range	Data Type	Output Values Hexadecimal	Decimal	Update Rate
0	0	0	1	4-20mA	2' complement	<0000–7878>	<0000–30840>	5.0ms
0	0	1	0	±10V	2' complement	<8618–79E8>	<–31208–31208>	2.5ms
0	0	1	1	±5V	2' complement	<8618–79E8>	<–31208–31208>	2.5ms
0	1	0	0	0-20mA	2' complement %	0–10000>	0–10000>	5.0ms
0	1	0	1	4-20mA	2' complement %	<0–10000>	<0–10000>	5.0ms
0	1	1	0	0-10V	2' complement %	0–10000>	0–10000>	5.0ms
0	1	1	1	±10V	2' complement %	<–10000–10000>	<–10000–10000>	5.0ms
1	0	0	0	0-20mA	binary	0000–F3CF>	0000–62415>	2.5ms
1	0	0	1	4-20mA	binary	0000–F0F1>	0000–61681>	5.0ms
1	0	1	0	0-–10V	binary	0000–F3CF>	0000–62415>	2.5ms
1	0	1	1	0-5V	binary	0000–F3CF>	0000–62415>	2.5ms
1	1	0	0	±20mA	offset binary	8000–F9E8>	32768–63976>	2.5ms
1	1	0	1	4-20mA	offset binary	<8000–F878>	<32768–63608>	5.0ms
1	1	1	0	±10V	offset binary	<0618–F9E8>	<1560–63976>	2.5ms
1	1	1	1	±5V	offset binary	<0618–F9E8>	<1560–63976>	2.5ms

Frequency Input Module (1794-IJ2) Image Table Mapping

Module Image

Frequency Channel 0															
% Full Scale or Acceleration Channel 0															
Frequency Channel 1															
% Full Scale or Acceleration Channel 1															
R	DIR 0	GS 0	F/A 0	WO 0	MPA 0	R	R	DIR 1	GS 1	F/A 1	WO 1	MPA 1			
Reserved													Diagnostics		
CF	SSM	FR 0	NOPTS 0		MPM 0	R	LF	FR 1	NOPTS 1		MPM 1				
Minimum Freq or Absolute Value of Acceleration Channel 0															
Frequency Scaling Divisor Channel 0								Frequency Scaling Multiplier Channel 0							
WOFG 0	WOFF 0	IGI 0	IFI 0	MFST 0		IS UP0	ACT 0	F/A AS0	MPDM 0		WOFM 0				
Minimum Freq or Absolute Value of Acceleration Channel 1															
Frequency Scaling Divisor Channel 1								Frequency Scaling Multiplier Channel 1							
WOFG 1	WOFF 1	IGI 1	IFI 1	MFST 1		IS UP1	ACT 1	F/A AS1	MPDM 1		WOFM 1				

Frequency Input Module (1794-IJ2) Read

(Octal Bit)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Decimal Bit	**15**	**14**	**13**	**12**	**11**	**10**	**09**	**08**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
0	Frequency 0 – 32,767 or 0.0 – 3,276.7 Channel 0															
1	% Full Scale 0.0% to 3,276.7% Channel 0 or Acceleration –32,768 to +32,767 Channel 0															
2	Frequency 0 – 32,767 or 0.0 – 3,276.7 Channel 1															
3	% Full Scale 0.0% to 3,276.7% Channel 1 or Acceleration –32,768 to +32,767 Channel 1															
4	R	R	Direction Ch 0		GS Ch 0	F/A Ch 0	WO Ch 0	MPA Ch 0	R	R	Direction Ch 1		GS Ch 1	F/A Ch 1	WO Ch 1	MPA Ch 1
5	Reserved												Diagnostic Status			

Where: GS = Gate state
F/A = Frequency/Accel alarm
WO = Wire-off alarm
MPA = Missing pulse alarm
R = Reserved

Frequency Input Module Write

(Octal Bit)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit	**15**	**14**	**13**	**12**	**11**	**10**	**09**	**08**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
0	CF	SSM	FR Ch 0	Number Of Pulses To Terminate Sampling Ch 0			MPM Ch 0		R	LF	FR Ch 1	Number Of Pulses To Terminate Sampling Ch 1			MPM Ch 1	
1	Maximum Frequency 0 – 32,767 – or – 0.0 – 3,276.7 – or – Absolute Value of Acceleration 0 to 32,767 – Channel 0															
2	Frequency Scaling Divisor 0 – 255 Ch 0								Frequency Scaling Multiplier 0 – 255 Ch 0							
3	WOFG Ch 0	WOFF Ch 0	IGI Ch 0	IFI Ch 0	Minimum Frequency Sample Time Ch 0				Init St Up Ch 0	ACT Ch 0		F/A AS Ch 0	MPDM Ch 0		WOFM Ch 0	
4	Maximum Frequency 0 – 32,767 – or – 0.0 – 3,276.7 – or – Absolute Value of Acceleration 0 to 32,767 – Channel 1															
5	Frequency Scaling Divisor 0 – 255 Ch 1								Frequency Scaling Multiplier 0 – 255 Ch 1							
6	WOFG Ch 1	WOFF Ch 1	IGI Ch 1	IFI Ch 1	Minimum Frequency Sample Time Ch 1				Init St Up Ch 1	ACT Ch 1		F/A AS Ch 1	MPDM Ch 1		WOFM Ch 1	

Where: CF = Communication fault
SSM = Safe state mode
FR = Frequency Range
MPM = Missing Pulse Multiplier
LF = Local fault mode
F/AAS = Frequency/Accel alarm select
WOFF = Wire-off fault frequency
WOFG = Wire-off fault gate
WOFM = Wire-off fault mode
IGI = Invert gate input
IFI = Invert frequency input
ACT = Acceleration Calculation Time
MPDM = Missing pulse delay multiplier
R = Reserved

Incremental Encoder Module (1794-ID2) Image Table Mapping

Module Image

R	PR1	PR0	S1	S0	C1	C0	G1	Z1	B1	A1	G0	Z0	B0	A0
Store 0 – Stored Counter Value on channel 0														
Store 1 – Stored Counter Value on channel 1														
Channel 0 – current counter value														
Channel 1 – current counter value														
Channel 0 – Counter word readback														
Channel 1 – Counter word readback														
Code for identification of software version														
Channel 0 Control Word – Sets the function of counter 0														
Channel 1 Control Word – Sets the function of counter 1														
Channel 0 Preset – value to load or compare with counter 0														
Preset 1 – value to load or compare with counter 1														

Incremental Encoder Module (1794-ID2) Read

(Octal Bit⇒)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit ⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word⇓	Read															
0	Not used		PR1	PR0	S1	S0	C1	C0	G1	Z1	B1	A1	G0	Z0	B0	A0
1	Channel 0 – Stored counter value on channel 0															
2	Channel 1 – Stored counter value on channel 1															
3	Channel 0 – current counter value on channel 0															
4	Channel 1 – current counter value on channel 1															
5	Channel 0 – Counter word readback															
6	Channel 1 – Counter word readback															
7	Revision read – software version code															

Where: A0 = Status of input A, channel 0 – bit = 1 when input is on
B0 = Status of input B, channel 0 – bit = 1 when input is on
Z0 = Status of input Z, channel 0 – bit = 1 when input is on
G0 = Status of input G, channel 0 – bit = 1 when input is on
G1 = Status of input G, channel 1 – bit = 1 when input is on
A1 = Status of input A, channel 1 – bit = 1 when input is on
B1 = Status of input B, channel 1 – bit = 1 when input is on
Z1 = Status of input Z, channel 1 – bit = 1 when input is on
C0 = Cal 0 – when bit is set, counter 0 has been calibrated (reset by CalReset)
C1 = Cal 1 – when bit is set, counter 1 has been calibrated (reset by CalReset)
S0 = Stored 0 – when bit is set, counter 0 value has been saved in Store 0 (reset by StoreReset)
S1 = Stored 1 – when bit is set, counter 1 value has been saved in Store 1 (reset by StoreReset)
Once a Store occurs, L0 and L1 are on until cleared by StoreReset (counter word bit 14)
PR0 = Preset 0 reached – when bit is set, counter 0 has reached value of preset
(reset by PresetReset)
PR1 = Preset 1 reached – when bit is set, counter 1 has reached value of preset
(reset by PresetReset)

Incremental Encoder Module Write

(Octal Bit) ⇒	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit ⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word⇓	Write															
0	Channel 0 Control Word – Sets the function of counter 0															
1	Channel 1 Control Word – Sets the function of counter 1															
2	Channel 0 Preset – value to load or compare with counter 0															
3	Channel 1 Preset – value to load or compare with counter 1															

Pulse Counter Module (1794-IP4) Image Table Mapping

Module Image

Counter 00 – 16–bit period measurement or low word of 32-bit period measurement for channel 0
Counter 01 – pulse counter for channel 0 or high word of 32-bit period measurement
Counter 10 – 16–bit period measurement or low word of 32-bit period measurement for channel 1
Counter 11 – pulse counter for channel 1 or high word of 32-bit period measurement
Counter 20 – 16–bit period measurement or low word of 32-bit period measurement for channel 2
Counter 21 – pulse counter for channel 2 or high word of 32-bit period measurement
Counter 30 – 16–bit period measurement or low word of 32-bit period measurement for channel 3
Counter 31 – pulse counter for channel 3 or high word of 32-bit period measurement
Readback of Control word 2 or Reserved M3 M2 M1 M0
Code for identification of software version
Control Word 0 – Sets the measure function
Control Word 1 – Sets the clock frequency and period multiple
Control Word 2 – sets the start of a new measurement

Pulse Counter Module (1794-IP4) Read

(Octal Bit⇒)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit ⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word⇓	Read															
0	Counter 00 – 16–bit period measurement or low word of 32-bit period measurement for channel 0															
1	Counter 01 – pulse counter or high word of 32-bit period measurement for channel 0															
2	Counter 10 – 16–bit period measurement or low word of 32-bit period measurement for channel 1															
3	Counter 11 – pulse counter or high word of 32-bit period measurement for channel 1															
4	Counter 20 – 16–bit period measurement or low word of 32-bit period measurement for channel 2															
5	Counter 21 – pulse counter or high word of 32-bit period measurement for channel 2															

(Octal Bit⇒)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit ⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
6	Counter 30 – 16–bit period measurement or low word of 32-bit period measurement for channel 3															
7	Counter 31 – pulse counter or high word of 32-bit period measurement for channel 3															
8	Readback of Control Word 2															
	Reserved												M3	M2	M1	M0
9	Revision read – software version code															

Where: M = positive edge measurement ready for the respective channel.

Pulse Counter Module Write

(Octal Bit) ⇒	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Dec. Bit ⇒	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word⇓	Write															
0	Control Word 0 – selects the measure function															
1	Control Word 1 – sets the clock frequency and period multiple															
2	Control Word 2 – sets the start of a new measurement															
3–4	Not used															

Operating Modes

Most reset commands are issued by the processor when it is placed in the PROG mode. However, the processor automatically issues a special command to any rack declared faulted regardless of the processor mode.

When this special command is received by the faulted remote I/O adapter, and processor restart lockout (PRL) has not been selected, the adapter will:

- continue to read output image data from the link, and queue block transfers if MCBs are detected
- reset all bits in the output words of digital modules
- reset all bits in the write words of analog modules up to but not including the write words of the safe state values
- assigns safe state values to outputs of analog modules
- issue a reply command

If processor restart lockout (PRL) has been selected, the adapter does not update data, does not issue a reply command, and does not clear the fault.

Chapter Summary

In this chapter, you learned how to address your I/O, how to determine rack size, and how the modules are mapped

Troubleshooting

Chapter Objectives

In this chapter, we tell you:

- about the indicators on the module front plate
- how to use the indicators for troubleshooting the module

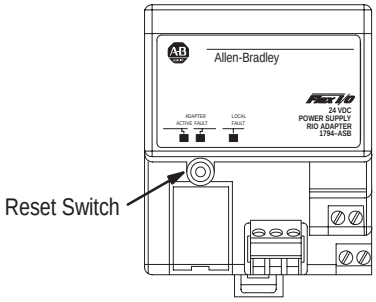
Fault Conditions

Three conditions can cause the remote I/O adapter to declare a communication fault.

- no remote I/O (link) communication for more than 100ms
- no commands issued to this address over the remote I/O link within the last 255 link transactions
- communication is lost to a module when Rack Fault Select is enabled

When any of these conditions exist, the adapter will:

- reset all digital outputs or leave them in their last state (depending on the position of the last state switch, **S2-1**). Refer to page 2–8 for an explanation of analog module responses.



A communication fault will be automatically cleared by a command from the processor if PRL (processor restart lockout) is not selected, or by pressing the reset switch on the front of the module if PRL is selected.

Important: Cycling power to the adapter will also reset faults. However, any queued block transfers will be lost, and all outputs will turn off, regardless of the position of the last state switch.

Troubleshooting with the Indicator Lights

The module has indicators on the front plate as shown below. Use these indicators for troubleshooting the module. The following tables describes problems that may occur, probable causes, and recommended courses of action.

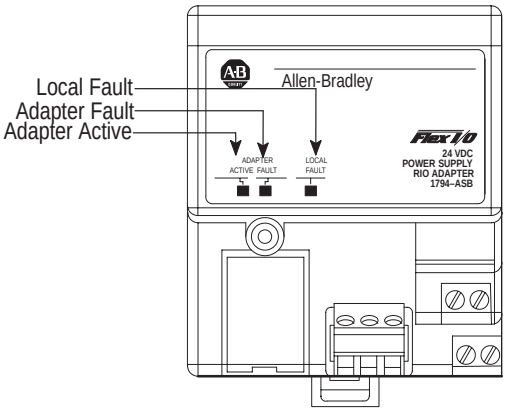
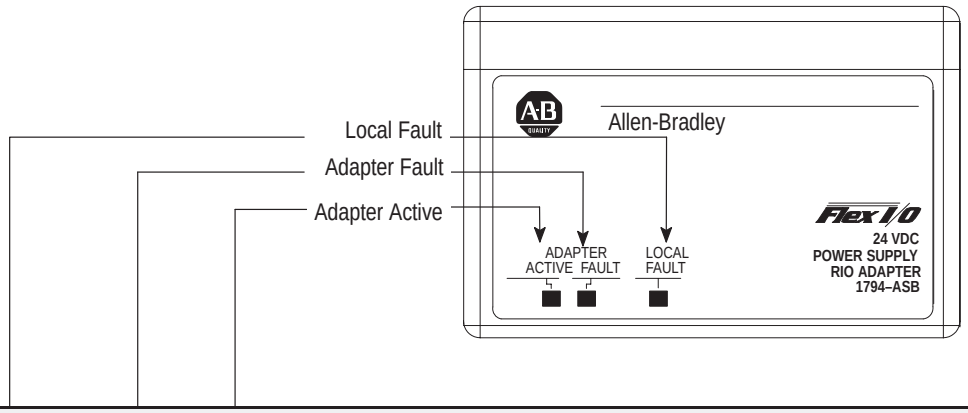


Table 4.A
Remote I/O System Troubleshooting Guide



Communication States and Module Display					
Local Fault	**Adapter Fault**	**Adapter Active**	**Operating State**	**Actions**	**Fault Reset**
Off	Off	On	Normal Communications	Outputs enabled. Communicating with scanner	Not applicable
Off	Off	Blinking	Program or Test mode	Outputs disabled Communicating with scanner Sending current input status back to scanner.	Not applicable
Off	Off	Off	Communication (lack of communications)	All modules; digital outputs in the rack follow HLS setting. Refer to page 2–8 for analog output action.	Resume proper communications (if no processor restart lockout)
Off	Blinking alternately		Processor lockout in effect during communications by scanner	Outputs follow last state switch setting. No replies sent to scanner	Press Reset button on front of adapter module (or cycle power) and resume proper communication.

Module Faults					
Local Fault	**Adapter Fault**	**Adapter Active**	**Fault Condition**	**Actions**	**Fault Reset**
On	On	Off	Noise problems on I/O bus	All outputs off. Communications off.	Cycle power. (This fault is a fatal fault.)
On	Off	Following Link Status	Different module installed replacing removed module.	Old inputs maintained. Outputs set to zero.	Auto-reset when incorrect module is removed; or cycle power to establish new identification for module.
Blinking	Off	On	Module not responding. Possibly module removed under power. Only module removed is affected.	Module not responding: Old inputs maintained. Outputs set to zero. All other modules: Outputs active (enabled). Sending current input status back to scanner.	Replace same module; or cycle power to establish new identification for module.
Processor in RUN mode Rack Fault Select NOT enabled					
Blinking	OFF	Blinking	Module not responding. Possibly module removed under power. Only module removed is affected.	Module not responding: Old inputs maintained. Outputs set to to zero. All other modules: Outputs disabled. Sending current input status back to scanner.	Replace same module; or cycle power to establish new identification for module.
Processor in PROG/TEST mode Rack Fault Select NOT enabled					

Module Faults					
Local Fault	**Adapter Fault**	**Adapter Active**	**Fault Condition**	**Actions**	**Fault Reset**
Blinking	Off	Blinking	Module not responding. Possibly module removed under power. Only module removed is affected.	Module not responding. All outputs set to 0. All other modules; digital outputs in the rack follow HLS setting. Refer to page 2–8 for analog output action. No replies sent to scanner.	Replace same module; or cycle power to establish new identification for module.
Processor in RUN/PROG/TEST Rack Fault Select enabled					

Configuration Faults					
Local Fault	**Adapter Fault**	**Adapter Active**	**Fault Condition**	**Actions**	**Fault Reset**
Off	Blinking in unison		Incorrect starting I/O group number.	Not applicable.	Turn power off. Set SW1 and SW2 correctly. Turn power on.
On	On	On	Incorrect baud rate setting.		
Blinking in sequence			Another adapter on the link has the same address.		
Blinking	On	Off	Illegal module placement – compact addressing mode selected.	Not applicable.	Correct module placement and cycle power.

Additional Faults and Module Displays					
Local Fault	**Adapter Fault**	**Adapter Active**	**Fault Condition**	**Actions**	**Fault Reset**
Off	On	Off	Random Access Memory fault.	Reset outputs. Stop communicating on remote I/O link.	Cycle power. (This may not correct fault.) If this does not correct the fault, replace the module with a known good module, and return the bad module to the factory for repair.
			Read Only Memory fault (on powerup only).	Outputs remain reset. Communication never starts.	
			Internal watchdog timer timed out.	Try to reset outputs. Stops communicating on the remote I/O link.	

Chapter Summary

In this chapter you learned how to use the indicators on the front of the module to troubleshoot your module.

Specifications

1794-ASB/C and D Remote I/O Adapter	
Note: These adapters cannot be used with PLC-2 processors The series D adapter can communicate with FLEX Integra analog modules.	
I/O Capacity	8 modules
Power Supply	**Note:** In order to comply with CE Low Voltage Directives, you must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter.
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	57.6k bps 115.2k bps 230.4k bps
Indicators	Adapter Active – green Adapter fault – red Local fault – red
Flexbus Output Current	640mA maximum
Isolation Voltage	500V ac between user power and flexbus
Power Consumption	450mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	15.7 BTU/hr @ 31.2V dc
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	 0 to 55°C (32 to 131°F) –40 to 85°C (–40 to 185°F) 5 to 95% noncondensing 30 g peak acceleration, 11(+1)ms pulse width 50 g peak acceleration, 11(±1)ms pulse width Tested 5 g @ 10–500Hz per IEC 68-2-6
Remote I/O Cable	Belden 9463 or equivalent as specified in publication ICCG-2.2
Remote I/O Connector Plug	Part Number 942029–03
Power Conductors Wire Size Category	 12 gauge ($4mm^2$) stranded maximum 3/64 inch (1.2mm) insulation max. 2[1]
Agency Certification (when product is marked)	• CSA certified • CSA Class I, Division 2 Groups A, B, C, D certified • UL listed • CE marked for all applicable directives

[1] Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

Differences Between Remote I/O Adapter Series A, B, C and D

Major differences between adapter series are indicated in the following table.

	Series A	Series B	Series C	Series D
Processor compatibility	Can be used with PLC-2 processors		Cannot be used with PLC-2 processors	
Standard Mode – Analog module removal under power	Block transfers continue when a block transfer module is removed from its base.	Ceases to do block transfers and a block transfer bit is set when a block transfer module is removed from the chassis. This error bit provides feedback to the processor that a block transfer module has been removed.		
Local Fault Indication	Local Fault Indicator only		With Rack Fault Select enabled, local fault indication sent to scanner, and local fault indicator lighted. With Rack Fault Select disabled, local fault indicator lights.	
Addressing	No complementary addressing		Three modes of addressing: Standard, Compact, and Complementary	
	Standard mode of addressing only			
Hold Inputs	When hold inputs is enabled, the adapter retains the last memory image present when a module is removed from the terminal base.	The hold inputs feature applies only to digital modules. When hold inputs is enabled, the adapter retains the last memory image present when a digital module is removed from the terminal base. **This feature does not apply to analog modules.** If you need this feature for analog modules, you must simulate it in your programming.		
European Union Directives Compliance	**Does not comply** with European Union Directives. **NO** CE mark.	Complies with European Union Directives. Has CE mark.		
Module Removal and Insertion Under Power (RIUP)	Always enabled.		No module removal and insertion under power when Rack Fault Select is enabled.	
Recognize 1793 Integra analog modules	**Cannot** recognize 1793 Integra analog modules			**Can** recognize 1793 Integra analog modules

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